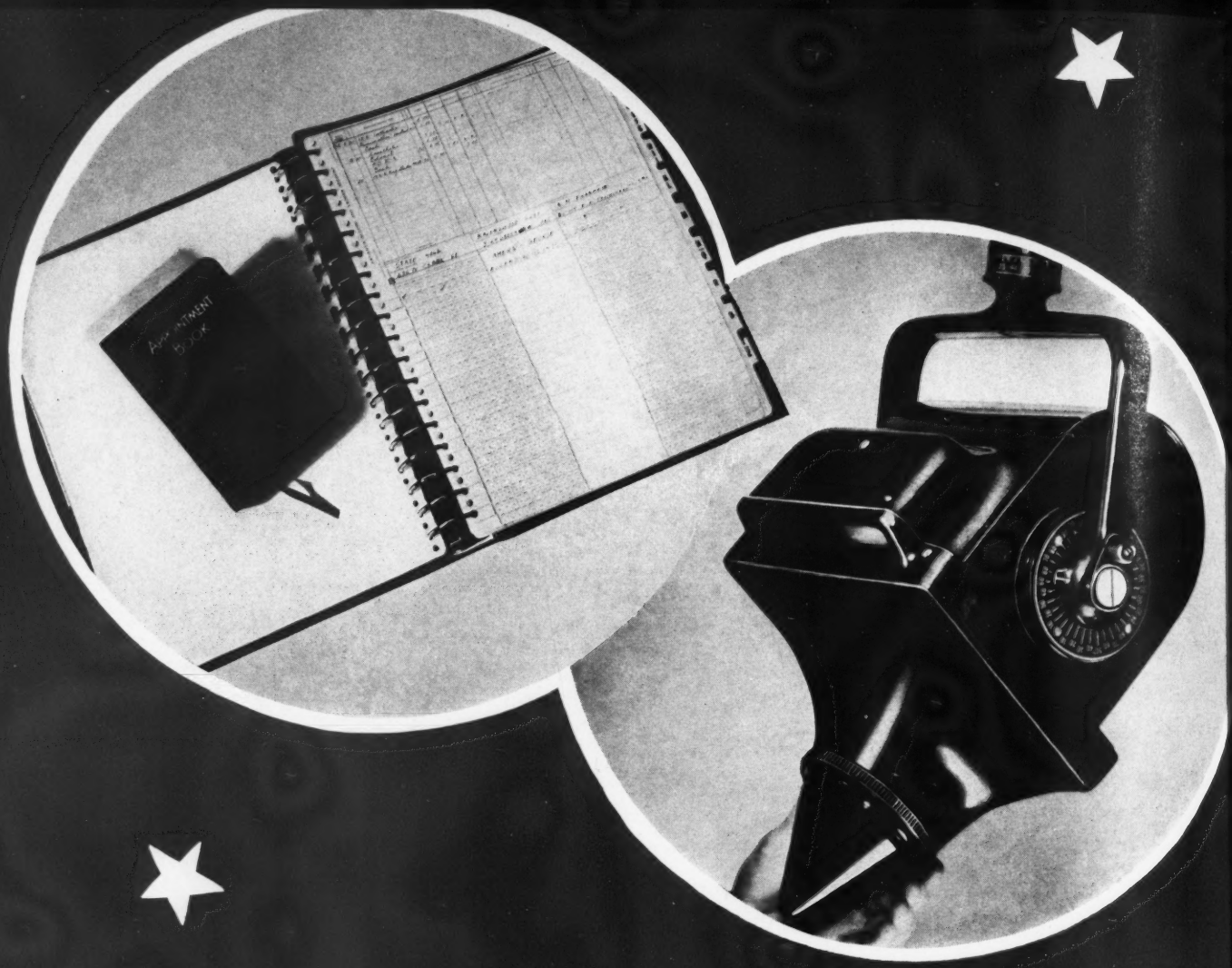
LIBRARY
College of Dentistry
UNIVERSITY OF SOUTHERN CALIFORNIA

The DENTAL DIGEST

SEPTEMBER, 1936
Vol. 42 No. 9



Ethics, Economics, Your Appointment Book and Ledger, All say, "X-Ray is no longer optional"

The day that dental X-ray equipment became shockproof, it ceased to be "optional" equipment for the serious-of-purpose, logical-minded dentist. So long as it was dangerous to use X-ray, one could fairly well justify his failure to adopt this diagnostic agent. Now both ethically and economically X-ray has become a necessity. Ethically one needs X-ray because it provides diagnostic evidence otherwise unobtainable. Economically one needs X-ray, if he is a dentist, *because* he is a dentist. His occupation, his entire livelihood is predicated upon his rendering a complete diagnostic service. To refer patients elsewhere contravenes the very objective of his chosen calling . . . to serve those who may come to him. It is illogical to refer patients away—and a notoriously unprofitable practice.

Owning your own X-ray unit very often converts the "just average" practice into a highly successful one. Almost any good X-ray unit is a safe investment today, but there are many sound reasons why CDX is the leader. The original shockproof dental X-ray unit, the CDX, through 13 years' refinement today offers 17 exclusive advantages that make it outstanding. The CDX's exceptional quality, too, has made possible the volume sales that account for its new, lower price. Write Dept. H49 for full particulars—you will not be obligated.

GENERAL ELECTRIC X-RAY CORPORATION

2012 JACKSON BOULEVARD CHICAGO, ILLINOIS

Unmarred—

IS HER CONTENTMENT

THE USUAL difficulties that beset wearers of new dentures cannot bother or distress this fortunate woman. So comfortable, in fact, does her denture feel, she scarcely is conscious of its presence in the mouth.

Her dentist thoughtfully made sure of that when he prescribed DR. WERNET'S Powder. It forms an elastic, adhesive, and protective cushion between the denture and the tissues. It holds the denture, *mechanically,* more firmly in place, and soothes and protects tissues that are tender. By promoting comfort and greater assurance, it makes it possible for the denture to be worn more regularly, thus hastening its mastery by the patient.

Send for YOUR supply—FREE!
Simply mail the lower portion of this page with your card or letterhead to WERNET DENTAL MFG. CO., 882 Third Ave., Brooklyn, N. Y.

DR. WERNET'S POWDER

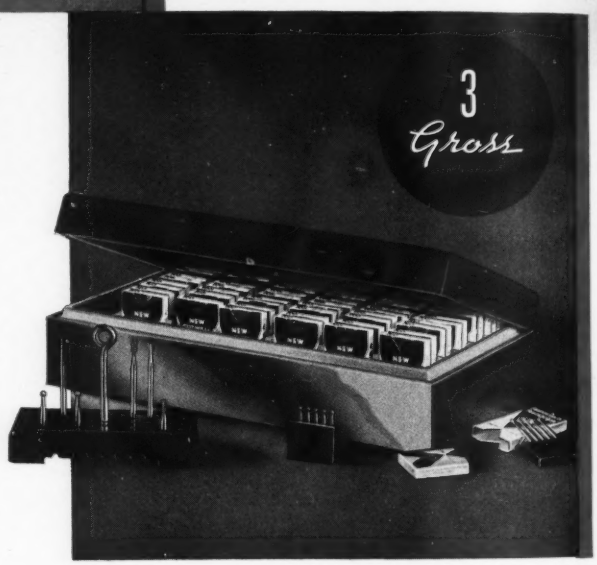
Speeds the Mastery of a New Denture!

EXTRA-VALUE NEW CUTWELL ASSORTMENTS

Outstanding in
EFFICIENCY
CONVENIENCE
ECONOMY

● The new five-gross assortment not only provides a more comprehensive selection of New Cutwells than has heretofore been available, but brings them to you at the lowest rate per gross for which New Cutwells ever have been sold. And in addition to the rich mahogany-finish assortment cabinet itself, a one-gross Bakelite tray-case, at no extra cost! In the light of recognized New Cutwell performance advantages, this combination represents a value that no extensive user of burs can afford to overlook.

For those whose requirements do not warrant the purchase of burs in five-gross lots, the New Cutwell three-gross assortment also offers exceptional value, with its handsomely finished cabinet—suitable for later use as a cigar or utility chest—and its supplementary Bakelite bur-holder for bracket table or sterilizer. You get all this for the price of the burs alone at the three-gross quantity rates, which are now the lowest in New Cutwell history. And in addition, you may have your choice of either the attractive copper-bound, mahogany-finish cabinet illustrated above or an all-wood chest richly finished in ivory-tan lacquer, at the same low price for the complete assortment!



Standard Five-Gross Assortment — $37.33
Standard Three-Gross Assortment — 23.00

THE RANSOM & RANDOLPH CO. . . TOLEDO, OHIO

ACCLAIMED

from coast to coast!

WEBER'S *New* EQUIPMENT LINE

n dental offices . . . dental depots . . . at the National A. D. A. Meeting and at numerous State Meetings in the last eighteen months, the new line of Weber equipment has met with enthusiastic ecclaim . . . acclaim unprecedented in the history of the Weber Company.

here is a definite reason why dentists all over the country are investing in WEBER equipment. It is he consideration of *scientific design, quality workmanship, utility and fair value* which are embodied n every Weber product! For over a third of a century now, Weber has been building dental equipment to meet the requirements of discriminating buyers. Weber equipment is sold by a nation-wide organization of selected dealers. Ask *your* dealer to show you the PLUS features and extra alue in this complete dental office equipment line or use the coupon in the back of this issue.

THE NEW WEBER MODEL "E" CHAIR

ew, improved design. Graceful symmetrical es. Beautiful, durable lacquer finish. Chrome m. Smooth, effortless elevating and lowering th the new type hydraulic pump. Arms, back-, headrest and footrest adjustable to meet e requirements of every dental operating pro-dure and patient comfort. Price $330.00.

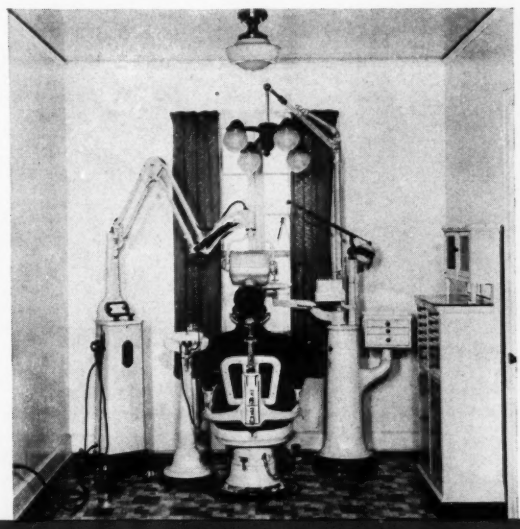
THE NEW WEBER SHOCKPROOF RAYDEX X-RAY

ncorporates the latest mechanical and electrical atures that assure 100% SAFETY and maxi-um utility. Oil immersed transformer and tube. acket design assures strength and stability plus se of handling and positioning of head. Only ental X-Ray with both kilovoltage range and versible timer. More than ample electrical ergy for every type of dental radiograph; intra-al, extra-oral and extremity. Stationary type 50.00; Mobile $895.00.

NEW WEBER UNITS

Startling In Design and Values!

he new line of Weber Units consists of *six* dels . . . four for installation at the left of the air and two for the right, one of which, the -4, is shown in the illustration. This is a very popular model having a standard assembly of engine, cuspidor, bracket table, bunsen burner plus a handy auxiliary instrument cabinet. Weber pioneered the two piece right hand assembly. Weber Units range in price from $210.00 to $470.00. The Weber Four-Cluster Light may be adapted to any model.



WEBER CABINETS

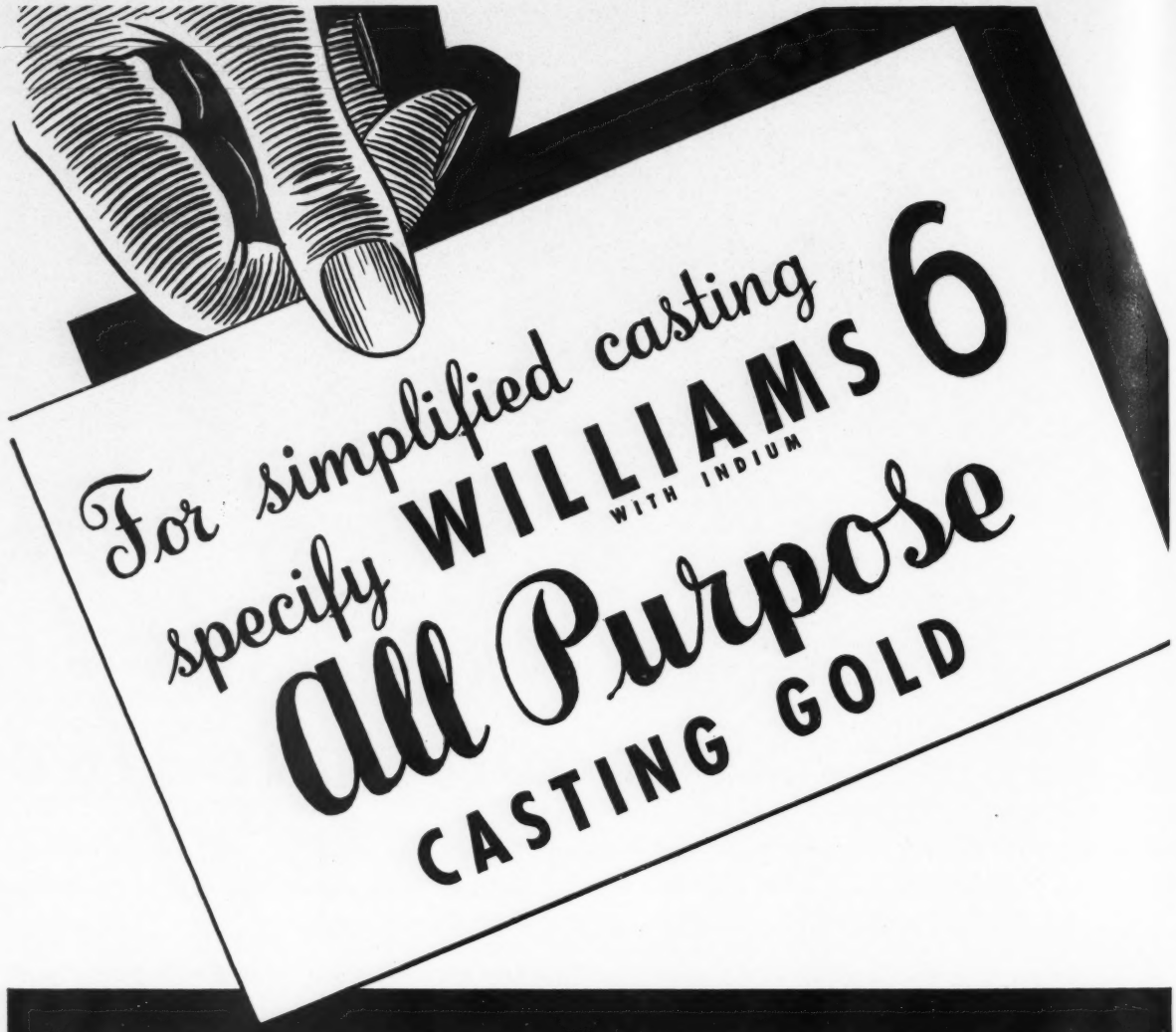
The Weber line of Cabinets include three models, the Model "C" priced at $165.00; the Model "AF" No. 1 (illustrated) priced at $210.00 and the Innovation Model "MCD" priced at $290.00. As its name suggests, the INNOVATION Cabinet, the master in the Weber line, offers something new and different in dental Cabinet design. Has two built-in X-Ray view boxes, lead lined film safe, a foot operated soiled linen hamper, adjustable shelf, storage closet, disappearing writing surface, ample working surface and storage compartments.

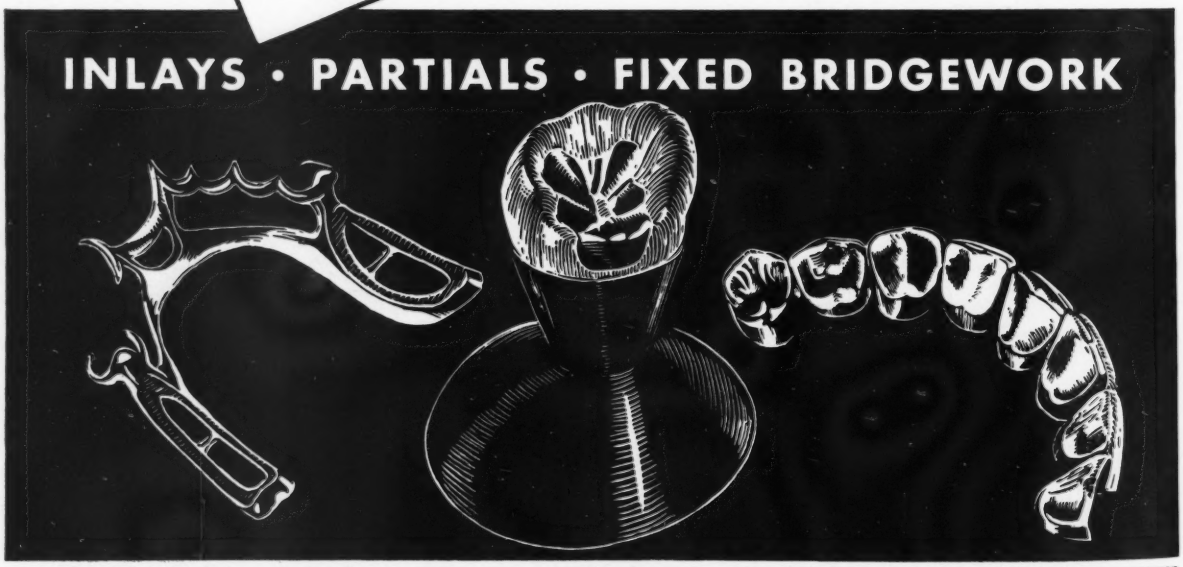
Other items in the Weber line include the following: Health and Rest Stool; Laboratory, Unit, Mobile and Wall type Engines; all types of Cuspidors (three colors of glassware optional); Operating Lights; Automatic Air Cut-Off; Dental furniture polish and fine lubricating oils.

All prices given are for Eastern Zone. Prices in the West are slightly higher.

THE WEBER DENTAL MFG. CO., CANTON, OHIO

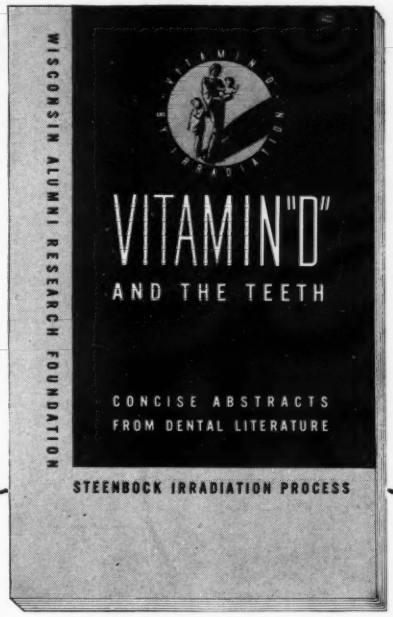
EXPORT OFFICES: 149 BROADWAY, NEW YORK CITY





ASK YOUR DEALER OR WRITE WILLIAMS GOLD REFINING CO.,

BUFFALO, N. Y.; SAN FRANCISCO, CALIF.; FORT ERIE, N., ONT.



Dependable sources of Vitamin D effect under the Steenbock Irradiation Process include:

Viosterol and Viosterol products produced under the Steenbock patents by Abbott, Mead Johnson, Parke-Davis, Squibb and Winthrop.

Irradiated Evaporated Milk produced by Borden, Carnation, Nestle, Pet and Wilson.

Irradiated Vitamin D fluid milk—now available in most large and many smaller cities.

Metabolized Vitamin D fluid milk available in nearly 300 cities.

Other Vitamin-D-enriched foods include: Cocomalt; Dryco powdered milk; Fleischmann's Irradiated Foil Yeast; Ovaltine; Quaker Farina, Muffets whole wheat biscuits, and Quaker and Mother's Rolled Oats; Sunfed Flour.

Let us

SEND YOU THIS FREE BOOKLET!

● Your "active" reference shelf will be enriched with knowledge of Vitamin D foods and Viosterol by this authoritative and highly readable 32-page booklet, free on request. Briefed from scientific papers by recognized authorities, it includes subjects of such far-reaching importance as:

Vitamin D in tooth building, nourishment and protection; its scarcity in foods; its importance in forming teeth and in preventing caries; the use of irradiated foods and Viosterol in the prenatal and nursing periods, in infantile rickets; the benefits of Vitamin D to growing children and adults.

Send for your copy today!

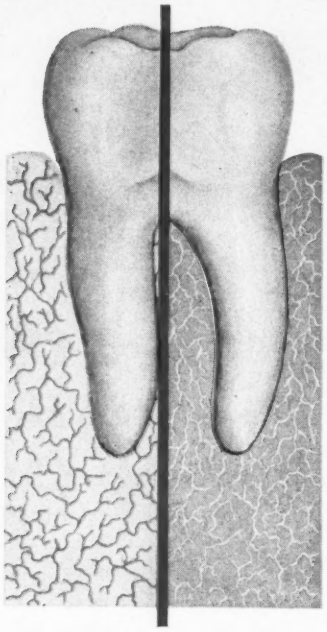
WISCONSIN ALUMNI RESEARCH FOUNDATION*

MADISON WISCONSIN

*A corporation not for private profit . . . founded in 1925 . . . to accept and administer, voluntarily assigned patents and patentable scientific discoveries developed at the University of Wisconsin. By continuous biological assays, the public and professional confidence in accurately standardized Vitamin D is maintained. All net avails above operating costs are dedicated to scientific research.

(Please use coupon on page 334)

OCCLUDED *Gum Capillaries* IMPEDE *Tooth Nutrition.*



Collapsed capillaries in soft, boggy gums, by impeding normal blood flow, hinder tooth nutrition.

Ipana gum massage stimulates normal flow in capillaries and thus aids in proper nutrition of teeth. Restoration of gums to robust firmness provides the teeth with solid anchorage.

Ipana cleans and polishes teeth to sparkling, natural whiteness. Your patients will thank you for suggesting gentle, effective Ipana for tooth and gum fitness.

plus massage, is the ablest dental assistant.

IPANA
TOOTH PASTE

Generous trial sizes of Ipana for your own and office use, cheerfully sent upon request.

BRISTOL-MYERS COMPANY
19-S West 50th Street, New York, N. Y.

Please send samples of Ipana to:

_____ D.D.S.
(Please enclose card)

St. & No. _____

City _____ State _____

(Or please use coupon on page 334)

The DENTAL DIGEST

VOLUME 42 — *September, 1936* — NUMBER 9

The Cast Porcelain Veneer Crown - - - - - - - - 296
James P. Gleason, D.D.S.

Clinical Comment - - - - - - - - - - - - - - 299
R. L. Wescott, D.D.S.

Galvanoplasty in Dentistry - - - - - - - - - - 300
Harry H. Asher, D.D.S., M.S.

The Editor's Page - - - - - - - - - - - - - 305

Eat To Live: Part I. The Vitamins - - - - - - - 306

"The First Hundred Years" (Continued) - - - - - - 314
Joseph J. Tolan, D.D.S., M.S.

About Our Contributors - - - - - - - - - - - 318

To The Editor - - - - - - - - - - - - - - - 318

Publisher's Notebook - - - - - - - - - - - - 322

EDWARD J. RYAN, B. S., D. D. S., Editor
ETHEL H. DAVIS, A. B., Assistant Editor

AN ORAL HYGIENE PUBLICATION. Published monthly on the fifteenth by Dental Digest, Inc. Copyright, 1936, by Dental Digest, Inc. Entered as second class matter at the Postoffice at Ashland, Ohio, under the Act of Congress, March 3, 1879. PUBLICATION OFFICES: 1005 Liberty Avenue, Pittsburgh, Pennsylvania. Merwin B. Massol, Publisher; Associates: J. J. Downes, W. Earle Craig, D. D. S.; R. C. Ketterer, Publication Manager. Subscriptions should be sent to the Publication Offices, 1005 Liberty Avenue, Pittsburgh, Pennsylvania. Manuscripts and correspondence regarding editorial matters should be addressed to the editor at 708 Church Street, Evanston, Illinois. Subscription, including postage: $2 per year in the United States, Alaska, Cuba, Guam, Hawaiian Islands, Mexico, Philippines, Puerto Rico. To Great Britain and Continent, $2.75; Canada, $2.00; Australia, $2.75. All other countries, $2.75. Single copies, 25c. DISTRICT ADVERTISING OFFICES: *Chicago*: Peoples Gas Building; W. B. Conant, Western Manager. *New York*: 18 East 48th Street; Stuart M. Stanley, Eastern Manager. *St. Louis*: Syndicate Trust Building; A. D. McKinney, Southern Manager. *San Francisco*: 155 Montgomery Street. *Los Angeles*: 318 West 9th Street; Don Harway, Pacific Coast Manager.

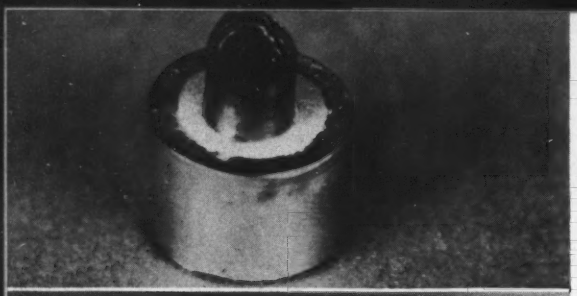


Fig. 1

THE CAST PORCELAIN VENEER CROWN

JAMES P. GLEASON, D.D.S.
Rochester, New York

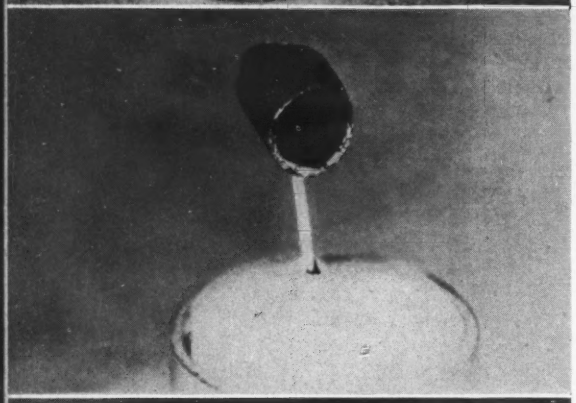


Fig. 2

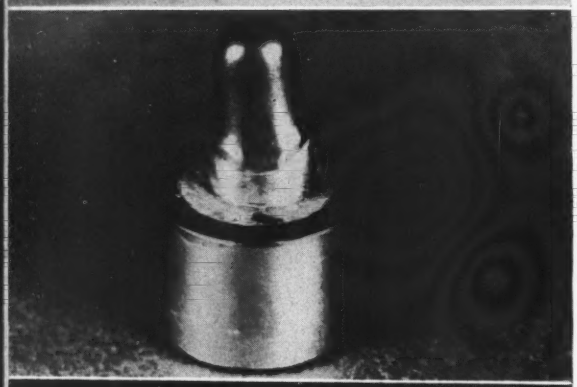


Fig. 3

Fig. 4

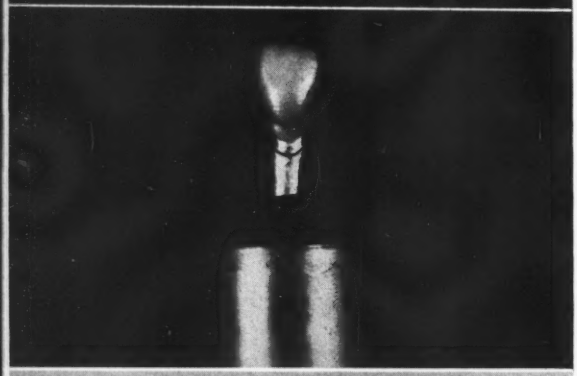


Fig. 5

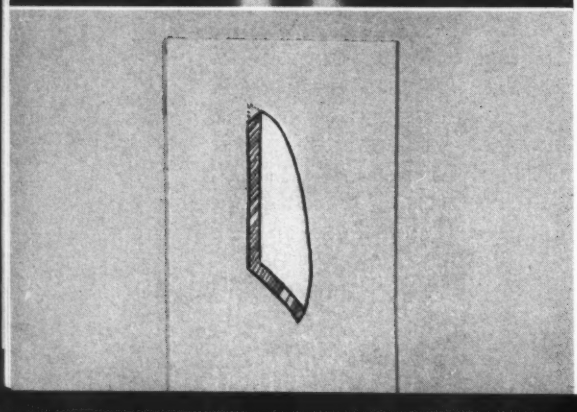


Fig. 6

WE ARE often called upon to use anterior vital teeth for bridge abutments, which are frail, badly decayed, and have many restorations. A three-quarter crown, therefore, would not be successful and the stress or length of the bridge excludes the porcelain thimble crown. In such cases only the porcelain veneer crown can answer the purpose. The assembled veneer crown with its boxing of soft gold, has been troublesome because of the wearing through of the incisal tip, the "popping out" of the facing, and frequent unsightly display of gold. The cast porcelain veneer crown, made by the technique to be described, gives a cast gold crown with a porcelain facing that overcomes all these objections.

The hardest casting golds are used, and the facing is boxed-in so that the possibility of wearing through of the gold at the incisal tip, or loss of the facing is eliminated. There is no display of gold, and even a badly rotated tooth can be shaped in the preparation so as to eliminate the showing of gold.

Esthetically the crown compares with a porcelain jacket, except for lack of translucency at the tip. The gingival tolerance is equal to the porcelain jacket.

Uses

Bridge Abutment—The cast porcelain veneer crown may be used as a bridge abutment: (1) on badly decayed or broken anteriors; (2) on thin frail teeth; (3) on rotated or abnormally placed teeth; (4) for a long span where a great deal of strength is needed, and (5) in any place where a strong abutment is needed.

Individual Crown—When a porcelain jacket will not hold, the cast porcelain veneer crown may be used instead. It may also be used in the case of bicuspids in which the buccal wall has split.

Preparation of Tooth

1. The labial preparation of the cast porcelain veneer crown is the same as for a jacket crown. All the enamel is removed and the shoulder carried 1 mm. beneath the free margin of the gums.

2. The incisal edge is ground as for a jacket.

3. The lingual preparation is the same as for a three-quarter crown, enough tooth structure being removed to allow for a thin veneer of gold; undercuts are eliminated, and a finishing line is made just above the margin of the gums, which connects mesially and distally with the labial shoulder.

4. The mesial and distal buccal margins are well rounded toward the lingual.

5. A copper band impression is now taken in modeling compound, and the patient dismissed (Fig. 1).

6. An amalgam die is made, and a wax thimble is made on the die (Figs. 2 and 3).

7. The die is warmed (always warm the amalgam die before dipping into melted wax), oiled with cottonseed oil, and dipped into melted wax. One-half hard inlay wax and one-half sticky wax makes a tough wax that will hold its shape and will not break. Dip several times until a fairly thick thimble is formed.

8. Carve the wax even with the edge of the shoulder.

9. At the second visit of the patient, place the wax thimble on the prepared tooth, and take a plaster impression. The thimble comes away in

Fig. 1—Copper band impression.

Fig. 2—Wax thimble.

Fig. 3—Wax thimble on die.

Fig. 4—Impression showing thimbles and die in thimble.

Fig. 5—Contouring of gingival of facing to match contour of shoulder.

Fig. 6—Beveling of edges.

the impression and the die is placed in the thimble (Fig. 4). The root-end of the die is oiled, and the model poured in stone.

The reason for this step is that the die must be accurately positioned in the model, as almost no retouching can be done on the proximal sides of the finished crown.

10. The bite is now taken, and the models are articulated.

Preparation of Facing

1. Select a Steele's facing or a vulcanite anterior tooth of the proper shade. The width of the tooth should be as near as possible the width of the space; the facing should be about 3 mm. longer to allow for the incisal beveling and for the 1 mm. that the facing needs under the gum tissue.

2. The facing is first adapted at the gingival, so that the margin of the facing matches the contour of the shoulder (Fig. 5). The incisal edge is next beveled toward the lingual, to about a 45° angle, grinding the facing down until it is the correct length (Fig. 6).

3. The inside of the facing is hollowed, heatless stones being used first. The stones are run along the length of the tooth. Cocoa-butter is used as a lubricant.

4. The bulk of the porcelain is quickly ground; then mounted stones, a little narrower than the facing, are run mesio-distally; the grinding is continued until a thin veneer of porcelain results. Leave the incisal edge the full width all the way across, and be careful not to grind away any of the mesial or distal borders.

5. With a seven-eighths carborundum disc, slant the mesial and distal edges slightly toward the lingual, beveling about 1 mm. (Figs. 6 and 7).

6. The gingival edge is also beveled 1 mm. This makes a continuous bevel around the facing. This beveled edge is the part of the facing that fits into the gold boxing.

7. Smooth and polish the beveled edges with medium garnet discs and with burlew discs. Do not glaze, as no part of the facing that has been ground is exposed, and the ground porcelain is much better for cementation.

Waxing the Crown

1. Melt a small cup of hard inlay wax, not too hot; in cold weather add some soft sheet wax; otherwise the wax will be too brittle to carve.

2. Warm the die and oil well; dip twice into the melted wax to give a thin veneer of wax, which is all that is necessary on the buccal; cut away the wax over the buccal shoulder (Fig. 8).

3. With a spatula, wax is added to the lingual to thicken the thimble and enable the operator to remove it without breaking.

4. Allow to cool; carve the wax even with the shoulder; remove the thimble of wax; and again, oil the die; put the thimble on, and place in position on the model.

5. Try the ground facing and see that the alinement is correct. If it bulges too much it is because the buccal layer of wax is too thick or else the facing has not been ground thin enough.

6. When the facing is properly positioned, clean it well with chloroform, and oil the beveled edges and the lingual surface. Hold the facing in the proper position and flow inlay wax between the facing and the wax thimble (Fig. 9).

7. Remove the die from the model, and flow enough wax to cover the incisal, mesial, and distal bevels, but do not flow any at the gingival at this time.

8. Cut the wax back to the edge of the bevels, on the labial, and remove the facing. This can be done by taking a knife and forcing it out from the incisal edge.

9. Clean the facing again with chloroform; oil; place it back in the box formed by the wax; it will set securely in its proper position.

10. Complete the waxing, flowing

Fig. 7

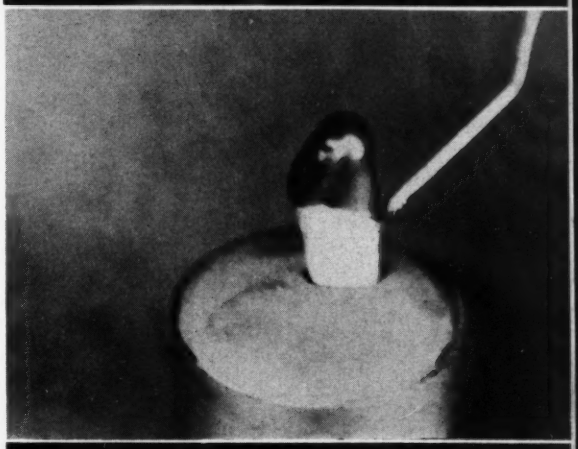


Fig. 8

Fig. 9

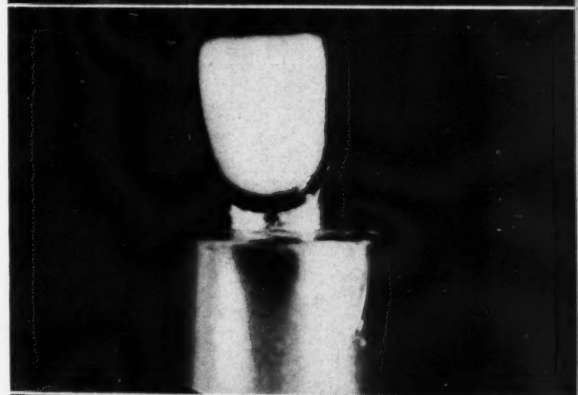


Fig. 10

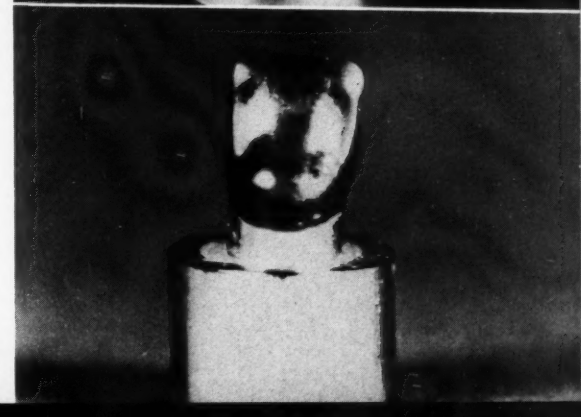


Fig. 11

Fig. 7—Ground facing; the beveled edges painted black.

Fig. 8—Thin veneer of wax on buccal, with wax cut away at shoulder, and thicker wax on lingual.

Fig. 9—Dipped die on model; facing in position; pointer to place where melted wax is first flowed.

Fig. 10—Crown waxed up from labial.

Fig. 11—Crown waxed up from lingual.

Fig 12

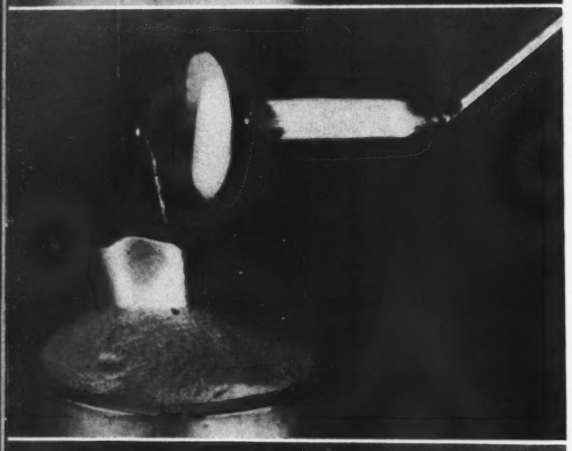


Fig. 13

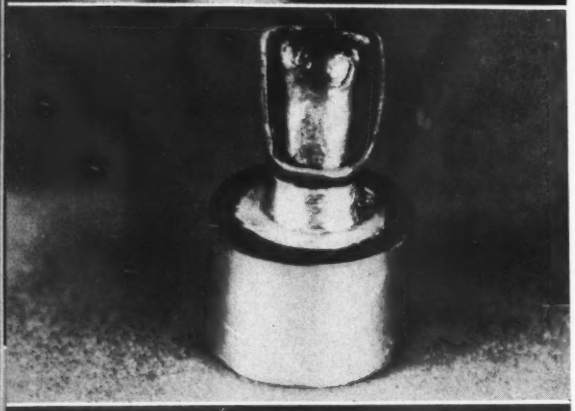


Fig. 14

Fig. 15

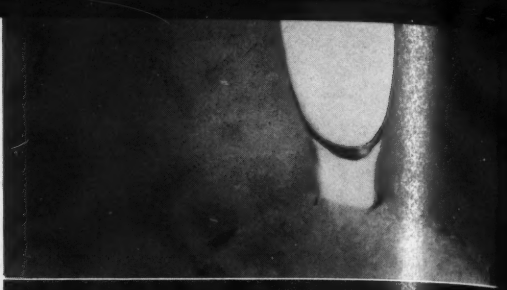


Fig. 17

Fig. 18

the wax over the gingival bevel and building the lingual up to the proper contour for the finished crown.

11. Carve, smooth, and polish the wax well (Figs. 10 and 11).

Removing the Facing

The wax has been cut back from the labial of the facing until only the beveled edges are covered with wax. Now remove the facing. This is done by putting a drop of sticky wax on the facing near the incisal edge, a piece of match wood about one inch long, is attached to the sticky wax, and let harden (Fig. 12). After it has hardened, pull it gently out; and when the incisal edge is free of the boxing, lift the facing out of the gingival slot. Repeat this several times until the facing goes in and out easily (Figs. 13, 14, and 15).

Investing

1. Attach the sprue to the cingulum.

2. Clean the wax thoroughly, using a soapy solution until all the oil is removed.

3. Dry and invest. Use an investment with a high degree of expansion, such as Cristobalite. Use no control powder.

4. Mix the investment fairly thick; use an asbestos lining in the casting ring, and invest carefully, so that there will be no bubbles.

5. Heat to a red heat, and cast while at its maximum heat. Use only the hardest golds.

6. Clean the casting well, inside and out, and examine for nodules, which are removed with a bur (Fig. 16).

Fitting the Facing

The technique for placing the facing in the gold boxing reverses the process of the removal of the facing from the wax. It will be noticed that the gingival of the boxing forms a concave slot; the gingival edge of the facing is set into this slot, and the facing is gently pressed into the boxing. Do not try to force into place or a thin edge of the porcelain will be fractured.

Fig. 12—Match waxed to facing to remove facing.

Fig. 13—Facing is first pulled out to clear incisal boxing.

Fig. 14—Facing is lifted out of gingival groove.

Fig. 15—Waxed crown with facing removed.

Fig. 16—The cast crown without facing.

Fig. 17—The finished crown.

Fig. 18—The crown on model.

Fig. 16

If any of the incisal edge of the porcelain can be seen the facing is not properly seated. This will be due either to nodules in the casting or to not enough expansion of the investment. Examine the casting again and make sure that there is nothing there that prevents the seating of the facing.

Do not try to do any fitting on the crown; this is done on the facing. With a medium garnet disc, go over all the beveled edges of the facing; a small stone can be used on the inside of the facing. Try the facing in again and repeat until the facing is seated in the proper position. Remember to watch the incisal edge of the porcelain, and do not stop the fitting until a flush joint is had at this point. This is the only place where the porcelain could be struck and dislodged, and never leave the edge of the facing extending beyond the gold.

1060 Mercantile Building.

Cementing the Facing

Cementing of the facing is done in the mouth; the crown is placed on the tooth; the proper shade of cement is selected, and a little of the powder is mixed with glycerine. The facing is set in position.

Examine the shade. If the shade is too light, add a little darker powder and try again. When the proper mix of powder is secured, the facing and boxing are cleaned and the cementing is done.

Conclusion

The time required to make this crown is about the same as that required to make a porcelain jacket crown. The fee can be figured on that basis. Although the time is long, the resulting crown with its good esthetics, and great strength, gives the strongest possible bridge abutment.

CLINICAL COMMENT

A DENTAL DISCUSSION PROMPTED BY AN ARTICLE ON "NEURALGIAS AND EAR SYMPTOMS" IN THE MEDICAL LITERATURE

R. L. WESCOTT, D.D.S.
Evanston, Illinois

J. B. COSTEN, M.D.[1] presents to the medical profession the problem of disturbances in occlusion of the teeth which cause pressure and destructive tissue changes in the region of the glenoid fossa. This subject vitally involves the dental profession; it is, therefore, necessary to discuss this subject from the dental point of view. Doctor Costen's investigations in the department of Otolaryngology at Washington University School of Medicine, and the Oscar Johnson Institute show that ear involvements, tinnitis, dizziness, headaches, atypical sinus pains, pains in the temporal and cervical regions and other reflected symptoms may be caused by this pressure and tissue destruction. Because of so many structures, nerves, and arteries within the glenoid fossa, and the close proximity to the ear canals, he shows how he has effected cures by relocating mandibles with the aid of dental procedures.

This subject is not entirely new to dentistry; whereas it is probably rather new to the medical profession and has never before been so ably presented as Doctor Costen has done. There are a number of sincere investigators who have studied this problem of trauma to the structures in and around the glenoid fossa, but their articles have appeared almost entirely in dental publications.

[1]Costen, J. B.: Neuralgias and Ear Symptoms Associated with Disturbed Function of the Temporomandibular Joint, J. A. M. A. 107:252 (July 25) 1936.

Review of Literature

Prentiss[2] of Iowa University made exhaustive studies of the anatomy of the mandibular joint and its movement in his preliminary report in 1918. He showed the mechanism and cleared the way for study of this subject. He showed the folly of adjusting dentures to existing jaw relations. Prentiss' sketches are used by Costen in a previous article.[3] Also the description of the movements of the mandible and ligaments show that Costen has studied Prentiss' work in detail.

Walter Henry Wright[4] in 1920 wrote a detailed report on Deafness as Influenced by Malposition of Jaws.

George S. Monson[5] in 1921 described Impaired Function as a Result of Closed Bites. Doctor Monson made a life study of this work and his observations and theories are used to some degree by every successful operator in correction of jaw relations.

D. J. Goodfriend[6] published an article on Abnormalities of the Mandibular Articulation in 1934. Doctor Goodfriend has previously reported[7] on this subject, and his complete reports and classification should be thoroughly studied by every otolaryngologist and dentist.

Tom Smith[8] in June, 1925, reviewed the literature on the eustachian tube in relation to dental occlusion. He wrote an exhaustive and splendid report on this subject. He made the first mention of the possible relation of the *tensor veli palatini* muscle to closed bites in that it does not properly ventilate the eustachian tube when the muscle is shortened. Doctor Costen mentions this as an important fact in diagnosis of his cases; namely, dizziness, definitely relieved by inflation of the eustachian tubes.

H. F. McGrane[9] in October, 1925, wrote on Traumatic Deafness Caused by the Retrusion of the Condyles of the Mandible on

(*Continued on page* 321)

[2]Prentiss, H. J.: A Preliminary Report Upon the Tempormandibular Articulation in the Human Type, D. Cosmos, 60:505, 1918; D. Digest, 24:500, 1918.

[3]Costen, J. B.: A Syndrome of Ear and Sinus Symptoms Dependent upon Disturbed Function of the Temporomandibular Joint, Ann. Otol., Rhin. & Laryng. 43:1 (March) 1934.

[4]Wright, W. H.: Deafness As Influenced by Malposition of the Jaws, J. A. D. A. 7:979 (December) 1920.

[5]Monson, G. S.: Impaired Function As a Result of Closed Bite, J. A. D. A. 8:883 (October) 1921.

[6]Goodfriend, D. J.: Abnormalities of the Mandibular Articulation, J. A. D. A. 21:204 (February) 1934.

[7]Goodfriend, D. J.: Symtomatology and Treatment of Abnormalities of Mandibular Articulation, D. Cosmos, 75:844 (September); 947 (October); 1106 (November) 1933.

[8]Smith, Tom: A Review of the Literature on the Eustachian Tube, with Data Indicating a Relation to the Dental Occlusion, J. A. D. A. 12:671 (June) 1925.

[9]McGrane, H. F.: Traumatic Deafness Caused by Retrusion of the Condyles of the Mandible on the External Auditory Canal, J. A. D. A. 12:1231 (October) 1925.

GALVANOPLASTY IN DENTISTRY

HARRY H. ASHER, D.D.S., M.S.
Chicago

THERE are many uncontrolled chemical and physical transformations that take place in all the intermediate and terminal materials used in restorative dentistry. These changes affect all types of restorations, such as baked fillings, castings, bridges, and partial dentures.

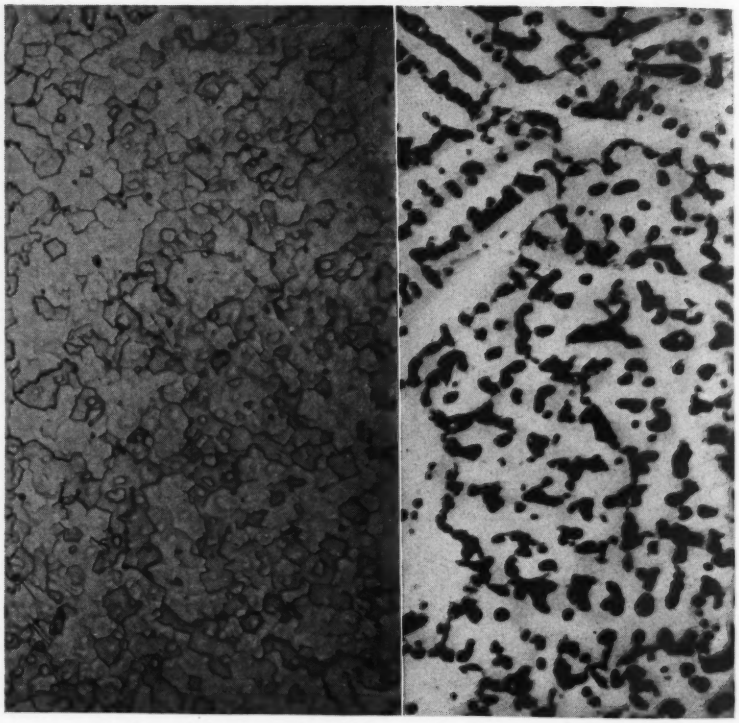
The process of making a simple inlay involves dimensional changes in the wax pattern; dimensional changes of the investing material, caused by the setting reaction, the subsequent heating to eliminate the wax pattern and excess moisture and to attain casting temperatures; and the greatest and most varying dimensional change in the casting metal.

Some of these variables are better understood than others and are possible to control. The manipulation of waxes and investments can be standardized within reasonable limits. Beyond this point all the changes involved in the heating of the mold, the melting of the casting alloy, and the solidification and cooling of the metal cause such variations in the end-result that they produce an imperfect restoration.

Mold expansions are not uniform, depending on the location within the mass of investment, the shape of the mold, source of heat, and ultimate temperature attained. Casting shrinkages depend on the composition of the alloy; variations in composition (new or old alloy); difference in quantity between casting and excess metal; period of heating; temperature of the molten metal prior to casting; type and size of sprue; and cooling treatment.

Castings are affected by many laboratory techniques. Soldering, heat treatment, or any other heating operation that brings about a greater movement of the atoms within the space-lattice of the crystals tends to cause the casting to spheroid. Prying the casting off models, grinding, and polishing will often affect the margins of the restoration. The softer the alloy, the easier it will become affected by these manipulations.

It is necessary to recognize that these variables occur. It is, therefore, essential to develop a technique in restorative procedures whereby it is possible to correct discrepancies brought about by all these conditions. It is not to be supposed that the majority of these corrections can be performed on the prepared tooth. Inaccessibility, the optical illusion of perfection brought about by a film of saliva or grindings, the impossibility of seeing many margins—all defeat this type of procedure. The only recourse lies in having an exact reproduction of the prepared tooth or section of the jaw to be restored.



A B

Fig. 1—Magnified photomicrograph of a bridge gold; A, normal crystalline structure of a good metal; B, eutectoid type due to 0.1 per cent contamination with base metal alloy.

Types of Model Materials

The materials for making models are of three types:

1. The first are siliceous materials, such as Kryptex and Diestone. These materials undergo dimensional changes while crystallizing and, therefore, are not entirely accurate. They are brittle and offer little resistance to swaging, grinding, and polishing operations.

2. The second type of model materials includes amalgams and low-fusing metals. The inaccuracies of these materials are readily apparent from the reported results of experiments on amalgam and low-fusing metal. With the same alloy, operators will obtain varying results. Amalgams are difficult materials to handle and the extremely complex nature of their setting results in non-uniformity in dimensional changes. Doctor Charles Lane[1] conducted some interesting experiments showing the distortions that occur while using this material.

It is often necessary to recast an abutment or restoration that has been placed on and off a base metal model.

[1]Lane, Charles: Application of Electrodeposition of Metals to Laboratory Procedures, Illinois D. J. 5:2 (January) 1936.

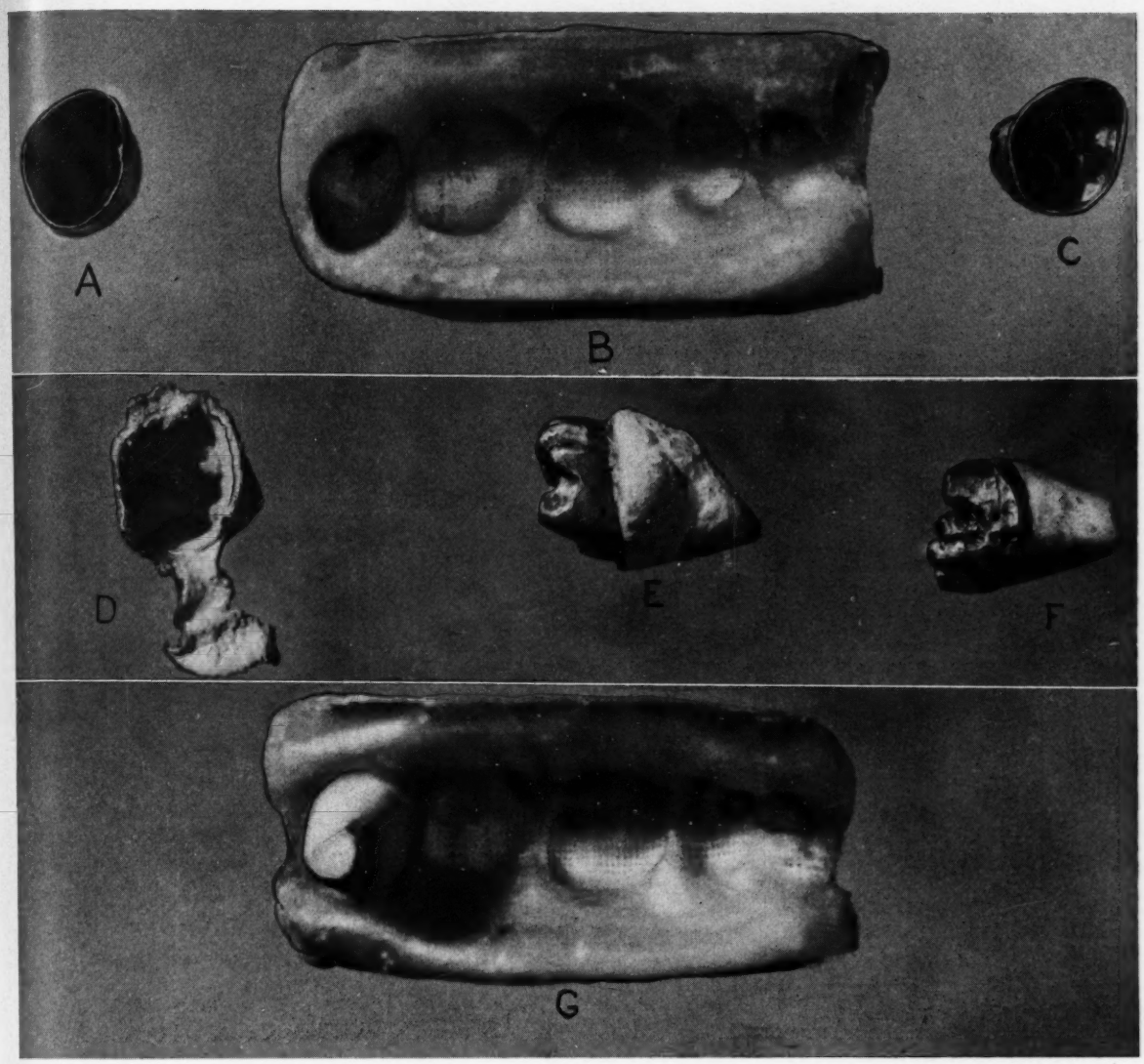


Fig. 2—Galvanoplastic reproduction of inlay preparation; A and B, tube impression and bite; C, conductive surface; D, electrodeposited copper shell removed from holder; E, shell backed with a strong plastic material; F, root-tip trimmed; G, prepared die inserted in wax bite.

The resulting alloy usually has unsatisfactory physical properties because of the contaminating base metal. Diffusion of atoms occurs between static metals that are in contact with each other and is greatly increased when friction occurs. Fig. 1 shows a 450 magnification photomicrograph of a bridge gold. View A illustrates the normal crystalline structure of a good metal and view B shows a eutectoid type of structure as a result of a 0.1 per cent contamination with a base metal alloy.

3. The third class of material used is electrodeposited. This is an electrochemical process known as *galvanoplasty which is the production, with the assistance of an electric current, of exact copies of articles of sufficient thickness to form a resisting body that may be detached from the object serving as a mold.* If a few precautions are taken, this process yields perfect reproductions of prepared teeth. Copper is the choice for galvanoplastic work ever since Professor Jacobi made known his discovery in 1838, to the Academy of Sciences in St. Petersburg, of the utility of galvanic electricity as a means of reproducing objects. It can be deposited chemically pure and has a tensile strength 20 per cent greater than smelted copper and is proportionately harder. Its specific gravity of 8.85 lies between cast and rolled copper. The microstructure of electrodeposited copper shows three types of crystal structures: (1) symmetrical groups of crystals; (2) conical compact deposits, and (3) broken or powdery structures. Fine-grained deposits are hard while coarse-grained and powdery deposits are soft. The color of a deposit is to some extent a criterion of its quality. A red-brown indicates a poor deposit, whereas a good useful one shows a rose color.

Requirements For Good Deposit

Current Strength—In order to obtain a deposit with the best physical properties in an acid-copper bath, it is first necessary to bring the current strength into proper proportion to

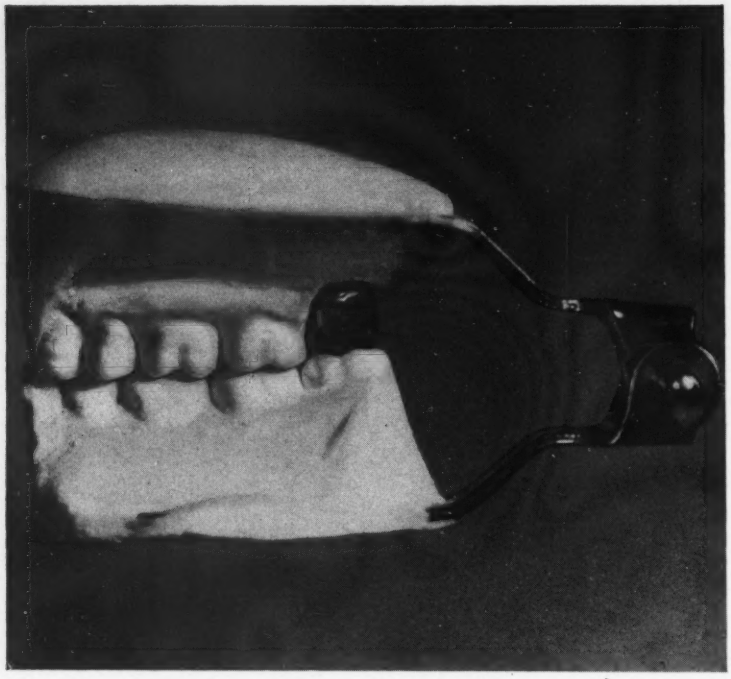


Fig. 3—Completed, articulated model with die in place.

the deposition surface. With the use of high current-densities, spongy deposits of a dark color or powdery deposits are obtained. The ideal current-density must be determined for each different cell. In one type of cell, it is reported that the current-density is 60 milliamperes per square centimeter of plating area.[2] In the plating apparatus, however, used in the work described in this article, it was found that the current-density used was much lower, and varied with the area. An average molar impression will be about 1 square centimeter. A single impression is started with from 3 to 4 milliamperes and after correction of the conducting surface is raised to 5 milliamperes and continued at this rate for about 8 hours. Two impressions are started at 4 milliamperes and raised to 8. Three impressions are started at 5 milliamperes and raised to 12. For a larger number of impressions the current-density is raised at a lower degree. Ten impressions are started at 10 milliamperes and then gradually raised to 40 milliamperes.

Acid Bath—Brittle and spongy deposits will also result from the use of a too-concentrated acid bath.

Formula—The best formula for galvanoplasty or electroforming is:

Copper Sulphate ($CuSO_4.5H_2O$) 212 Gm. or 28 oz.

Concentrated Sulphuric Acid (H_2SO_4) 75 Gm. or 10 oz.

Distilled Water, q. s. 1 Liter or 1 Gallon.

Type of Copper Sulphate—A common error when first making an electrolyte is not to specify the type of copper sulphate desired. If anhydrous copper sulphate is used, the entire weight of crystals is copper sulphate instead of 64 per cent as in the case of the desired blue vitriol. This will cause an adsorption of water from the bath and an increase in the concentration of the acid. The stronger the acid in the bath, the more rapid is the precipitation of the copper upon the molds, resulting in a spongy and inelastic deposit. In the preparation of an electrolyte, the copper sulphate crystals are first dissolved in water and then the acid is added slowly. Satisfactory results are obtained if the composition of the plating solution is maintained constant to within 2 per cent of the actual concentration of each constituent.

Anode—The next consideration for a good deposit is the anode. This should be of the purest electrolytic copper and rolled as hard as possible. Small quantities of iron or oxygen are not considered harmful impurities, but arsenic, antimony, bismuth, and silver are considered detrimental and should not be present in excess of 0.01 per cent.[3] A 6 by 1½ inch rod of electrolytic copper will cover at least 1000 impressions and costs about 75 cents. This is suspended by a stainless steel sheet curved at one end to hold the anode bar and at the other end to snap over a rod, at the top of the tank, which is attached to the source of positive current.

[2]Viverito, J. A. and Damiano, John: Electrodeposition in Dentistry, D. Cosmos, 77: 1202 (December) 1935.

[3]Ollard, E. A. and Perring, J. W.: Practical Plating: Deposition of Copper: II. Acid Copper Solution, Metal Industry, London, 45:423-424 (November 2) 1934 and 519-521 (November 30) 1935.

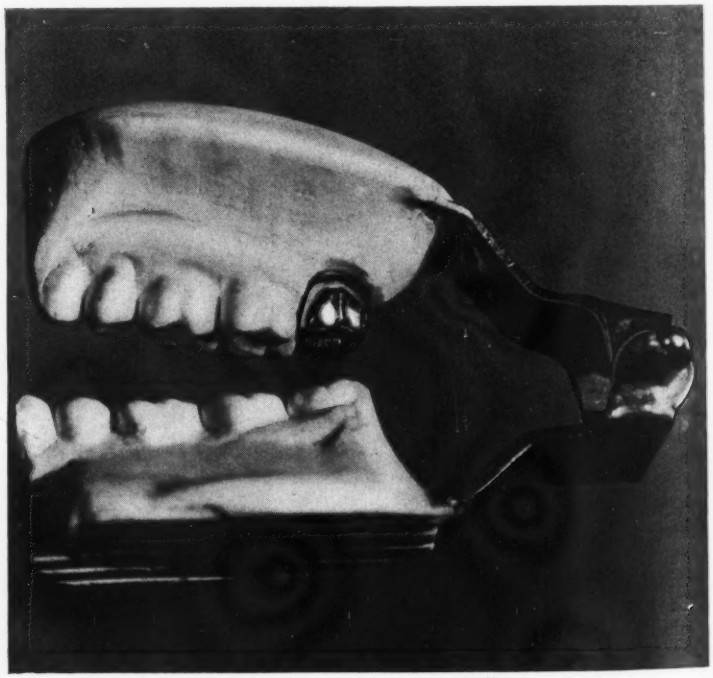


Fig. 4—Completed articulated model with finished restoration.

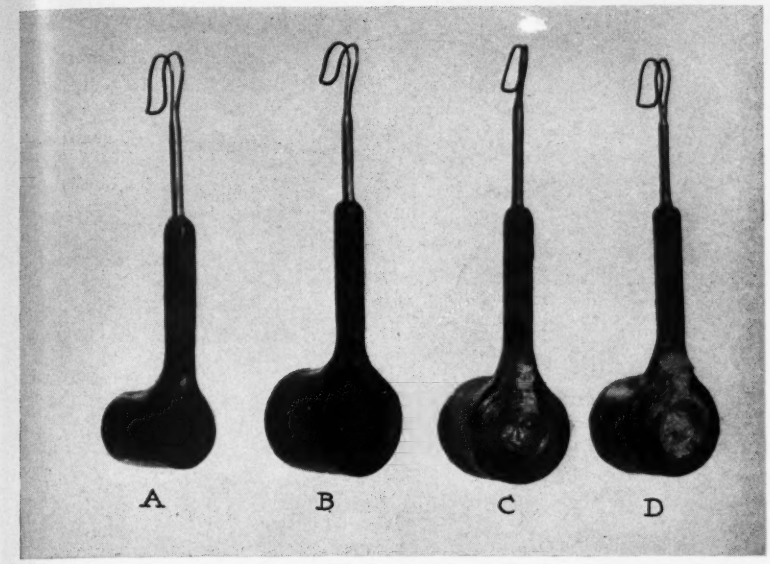


Fig. 5—The Svitenky holder. A, for small impressions; B, for large impressions; C, impression in place and bronzed; D, completed copper-plated shell.

Fig. 6—Assembled apparatus.

Type of Cell Apparatus

The type of cell apparatus depends on the facilities that are available to the operator. The principle and construction of cells are simple but do involve a cost that is nearly equaled by the sale price of cells on the market. These can be produced cheaper because of the volume. If the operator wishes to construct one, however, it would be advisable to consult a local electrician or electrical engineer who would be guided by the type of current and other facilities available. Low voltage direct current is the most essential requisite for electrodeposition. Galvanoplasty can be carried on with direct current, alternating current with a transformer, a storage battery, a dynamo, or a low voltage generator. The tank can be of either glass or, preferably, hard rubber, both of which are resistant to acid solutions. There is no danger of breakage with the rubber tank which often occurs with the glass receptacles. It is not necessary to have more than 1 gallon capacity. The hard rubber tank in use measures 8 by 11 by 6 inches. Two parallel stainless steel rods are set about 1 inch from the top across the width of the tank. The anode bar is suspended from one while the impression-holders are suspended from the cathodic rod.

Technique For Galvanoplastic Reproduction of Inlay Preparation

The technique for galvanoplastic reproduction of an inlay preparation (Fig. 2) is as follows:

1. Obtain a tube impression in wax or compound and a bite (Fig. 2, A and B).
2. Render the surface conductive by lubricating it with oil and dusting on a fine copper-bronze powder (Fig. 2, C).
3. Seal bronzed impression into impression holder.
4. Place in bath carefully so as not to trap any air.
5. Correct the metallized surface. Allow to plate for about five minutes; wash and dry. Dust more copper-bronze on areas that have been denuded of the first coat. Replace in bath carefully.
6. Allow to become electroplated for 8 hours or overnight.
7. Remove electrodeposited copper shell from holder (Fig. 2, D).
8. Back the shell with some strong plastic material (Fig. 2, E).
9. Trim the root-tip (Fig. 2, F).
10. Insert the prepared die into the wax-bite (Fig. 2, G) and complete the articulated model.

Choice and Suggestions Regarding Impression Materials

The individual operator's skill and familiarity with his own technique will guide him in his choice of impression materials.

1. Hard inlay waxes will yield best results for tube impressions, whereas compound is best suited for buccal impressions.
2. The treatment of nonmetallic surfaces in order to make them impervious to the deposition solution and render them conductive is important.
3. Plasters and similar materials must be covered with either varnishes or shellacs. The latter is better and is applied with several thin coats.
4. Graphite, or graphite and iron filings have been used for the purpose of metallizing a surface.
5. Commercial copper or copper-bronze powders, having the size of the metal flakes, about 20 microns is especially suited for this work.

Impression Technique

1. The surface of the impression is lubricated with a fine camel's hair brush and the powder is applied with another brush.
2. The excess powder is washed out

and the impression is dried with a blast of air.

3. An impression holder is selected and the impression is placed into the hollow of the holder and sealed with soft wax.

4. Electrical contact is made by dusting a strip of copper powder from the bronzed impression to the contact point of the holder.

5. The bronzed impression is filled with the electrolyte carefully so as not to trap any air bubbles in the deeper parts, and then is placed in the bath.

6. The holder is clamped onto the cathode bar with the impression facing the anode, and allowed to plate for about five minutes.

7. The holder is then removed; the impression washed and dried, and additional bronze powder added to the spots that have not maintained their original coating and thus have not begun to plate.

8. The holder is returned to the bath, with the same precautions against entrapping air, and then allowed to become electroplated from about 8 hours to overnight.

9. The copper shell is filled with a stone, Kryptex, amalgam, or low-fusing metal, and then removed from the impression.

10. The die or model is trimmed, inserted in the bite, and articulated.

11. If an entire copper-plated model is desired, the die is inserted in the bite, the root-tip is lubricated heavily or has some wax melted over it, and the entire mass treated like an inlay.

With the conditions described thus far, the plating will take effect at all areas regardless of their relationship to the anode.

12. The copper shell is filled with plaster and articulated, and a model is produced that has metal for all the relationships and landmarks. The difference in value of such a model as compared to a plaster model, however, does not compensate for the additional time spent and the difficulty in its construction. A good plaster model will give all the relationships with the opposing and adjacent teeth without the difficulties attendant to the all-copper model.

Wax Patterns, Casting, Finishing

Wax patterns are constructed on the copper dies, cast, and then finished on the dies. All the variables attendant to the casting technique are corrected on the die. Such castings never have to be touched on the cavosurfaces on the prepared tooth. Some correction, however, may have to be performed for the occlusion or contact depending on the care in treating the bite. There is a technique[2] advocated for casting directly on these copper dies and destroying the die during the removal of the casting. The first defect in this technique is that the coefficient of expansion of the copper will give a variable that may not be desirable; and second, that the loss of the die defeats the entire purpose of electrodeposition. Castings against models can be made satisfactorily using a model investment.

Impression Holder

One of the difficulties encountered with the use of electrodeposition is with the impression holder. The holders used in this work were designed and made by E. Svitenky and overcome all the difficulties of loose attachment of the impression, broken electrical contact, floating, and short life. There are two sizes which cover all needs. A simple buccal impression is sealed over the opening of the holder and then treated in the same manner as a tube impression (Fig. 5).

Conclusion

Many additional operations can be added but their values are questionable. The use of additives or buffers such as colloids, glue, or phenolsulphonic acid are debatable.[4] The theory of this practice is that the additives reduce the grain-size of the copper deposits. Many investigators, however, discourage this practice as the addition agent is usually adsorbed in the electrodeposit resulting in a deposit that has poor physical properties. Phenolsulphonic acid has been used with some success, but necessitates "aging" at 400 amperes per gallon before satisfactory results are obtained.[5] With the technique employed, however, the high current density and the temperature used precludes its use in dental galvanoplasty.

Agitation is unnecessary at the extremely low current density employed. An occasional stirring, which occurs at the time of the insertion or removal of the impression-holders is sufficient. When rapid deposition is necessary, as in the printing industry, violent agitation is used.

An attempt to increase the conductivity of the surface by silvering was made, but the gain was negligible. The bronze may be silverized using a silver cyanide solution or two special solutions.[6] The formula of the first is:

6 Gm. per liter silver nitrate
30 Gm. per liter sodium cyanide

The formula of the second is:

Solution A:
Pyrogallic Acid, 7 Gm. per liter
Citric Acid, 4 Gm. per liter
Solution B:
Silver Nitrate, 40 Gm. per liter
Mix 4 parts of Solution A with 1 part Solution B; stir well and pour over bronzed impression.

The latter technique is used in the gramaphone industry.

The use of alloy anodes is not practicable inasmuch as the rate of dissolution of the alloying elements is not uniform and produces unsatisfactory deposits. Using alternate deposits of copper and nickel results in a deposit having a higher tensile strength than copper alone, but the complexity of the technique does not repay for the difference.

Another technique for making metal dies is with the use of metal spraying.[7] Studies of the microstructure of sprayed metal shows a rough matted finish consisting of small flakes of metal overlapping and interlocking with minute cavities and pores. The deposit is comparatively soft and does not give the characteristically hard elastic structure of electrodeposition. Whether damage to the impression results from metal spraying remains to be seen. Because of the defects of this process and because the apparatus for this work is so expensive, it cannot be regarded as a serious competition to electroplating.[8]

55 East Washington Street.

[4] Taft, Robert: Theories of Addition Agent Action, Trans. Electrochem. Soc., 63: 1933.

[5] Boughay, H. F.: The Application of Electrodeposition to Printing, J. Electrodepos. Tech. Soc. 44, 1934.

[6] Smith, L. F.: Deposition on Nonconducting Surfaces, Metal Industry, London, 48:191 (February 7) 1936.

[7] Chutsian, Kegham: The Cosmic Spray and Its Application to Prosthetic Dentistry, Illinois D. J. 5:168 (May) 1936.

[8] Phipps, A. E.: The Development and Application of Metal Spraying, Metal Industry, London, 48:553-558 (May 15) 1936.

The Editor's Page

FOR fifteen years Monson and his followers have asserted that some form of deafness, reflex pain in the head, irritation of the tongue may be produced by the retrusion of the condylar heads on the structures in or adjacent to the external auditory canal. They elaborated a technique based on these contentions for restoring occlusal deformities by the use of dental appliances. The clinical application of this work was based chiefly on the fundamental anatomic studies made by Prentiss in 1918. During these years scant attention has been given the problem by otologists or physicians generally.

In a recent publication J. B. Costen[1], a physician, has presented a worthwhile statement of the many and elaborate symptoms frequently associated with a disturbed function of the temporomandibular joint. On two points, we must take exception.

First, Doctor Costen makes a statement which leads the reader to assume that he has priority of discovery: "When this group of pain symptoms and deafness were proposed in 1933 as comprising a symptom complex regularly associated with destruction of the mandibular joint, it was considered as not rare but of infrequent occurrence." Dental writers antedated Doctor Costen by at least fifteen years, and although the dental literature on the subject has not been voluminous, it has been precise, informative, and recurring.

Second, Costen's presentation makes diagnosis all-important and treatment a mere matter of filling the prescription by any competent dentist on the physician's order. In this type of treatment case study and cooperation between the physician and the dentist is fundamental if successful results are to be expected. The physician who frequently knows little of the forces of occlusion or of restorative dentistry should *refer* indicative cases to a competent dentist; he should not attempt *prescription* in a field in which he is not qualified to prescribe. In the correction of these cases dentists expect the same courtesy in referring patients that one physician expects from another or that the physician would expect from the dentist.

In Costen's series of 125 cases neuralgias of the face and head were encountered more frequently than ear symptoms. Costen's observation on this point is interesting: Ear symptoms are more frequently found in edentulous mouths produced by pressure on the eustachian tubes; pain symptoms (headache, glossodynia, xerostomia, herpes) are usually found in "wrecked" mouths in which some natural teeth remain *in situ*. Excessive loss of the vertical dimension of the jaws as a result of abrasion, occlusal wear, extraction, and nonphysiologic dentistry may, therefore, be factors in producing pain effects. Eighty-five cases in the series fell into the pain group whereas thirty-five cases presented varying grades of deafness.

Doctor Costen explains the pain in the "mandibular joint syndrome" anatomically:

1. Pain is due to *erosion* of the bone in the glenoid fossa. The head of the condyle then delivers a traumatic blow against the thin bone which is transmitted to the dura mater.
2. Pain is due to *irritation* of the auriculotemporal nerve of the trigeminal, thus producing pain in the area of distribution of that nerve (temporal and vertex region).
3. Pain *is reflex* over the chorda tympani branch of the facial nerve.

After a reading of a fine presentation, such as Costen's, there is a likely danger of the therapy of enthusiasm. Obscure pains and aches, even those infectious in origin, may appear to lend themselves to treatment by extensive dental rehabilitation. Persons with failing hearing, even the cases due to shortened bone conduction, may find themselves undergoing futile dental rebuilding. Obviously pain that is infectious in origin or the deafness produced by lack of bone conduction will not be relieved by repositioning the mandible. Dentists are warned not to plunge into treatment too soon, not to promise too much. Only after careful case study, with the physician and dentist cooperating on an equal status in their distinct and respective rôles, should treatment in these cases be attempted.

To present to readers a critical estimate of Doctor Costen's article from the dental point of view an experienced worker in this field was invited to prepare a discussion. This discussion, written by R. L. Wescott, D.D.S., is published on page 299 of this issue.

[1]Costen, J. B.: Neuralgias and Ear Symptoms Associated with Disturbed Function of the Temporomandibular Joint, J. A. M. A. 107:252 (July 25) 1936.

EAT TO LIVE

PART I: THE VITAMINS*

NAME	DESCRIPTIVE NAME	APPLICATION OF TERM	ASCRIBED FUNCTIONS	STORAGE	ASCRIBED RESULTS OF AVITAMINOSIS OR SYMPTOMS OF DEFICIENCIES OR ABSENCE
VITAMIN A Includes: (1) Vitamin A itself; Precursors of A: (2) alpha (3) beta (4) gamma carotene (5) cryptoxanthin NOTE: Vitamin A may be a *sterol* (biosterol, ergosterol).	Anti-Infective Anti-Ophthalmic Formula: C_{20} H_{30} O NOTE: Anti-Infective "seems to be not a well-chosen term." (*McCollum*) Vitamin A should be regarded as "a normal nutrient with far-reaching functions, rather than ... as an 'anti-' anything." (*Sherman*)	"Vitamin A is applied to any one of several substances or to a mixture of them producing a specific, demonstrable characteristic response in the animal body." (*See under Name*) [*From*: J.A.M.A. **106**: 1733 (May 16) 1936.]	Exact function has not been established. Concerned with growth. Believed to aid in resistance to (not prevent) some infections when reserves are exhausted and intake is inadequate in diet. Specific in treatment of nyctalopia (night blindness). Promotes appetite and digestion. These enumerated functions seem to be the only ones for which there is scientific evidence. There has been no adequate corroboration of numerous other claims.	The body can store Vitamin A in abundance, especially in visceral tissue.	Suspension of Growth. Xerophthalmia (specific). This is a characteris disease, and is the most common evidence of minosis A. Rachitis (one factor). Nyctalopia (night blindness). Specific in trea of this disease. Possible sterility due to failure of ovulation. Cornification of secreting epithelium. Failure of appetite and digestion. Odontoblasts revert to osteoblasts. Susceptibility to infections: a) glands at base of tongue b) sinuses and ears c) eyes d) tear glands e) salivary and lymph glands, lungs, nose, skin f) kidney, ureter, bladder g) alimentary canal. TEETH-GUMS: Dry mouth, hoarseness Deformity of incisors due to deficient dentin mation Defective tooth and enamel formation (Howe back; May Mellanby). NOTE: Overabundance of Vitamin A will no colds, "but when we have a deficiency in bodily the surface epithelium whose resistance is low, buffered mechanism is lowered to resistance, come more susceptible to infection."

*Prepared by the Editorial Staff of THE DENTAL DIGEST.

"One of a class of substances of unknown composition, existing in minute quantity in natural foods and necessary to normal nutrition and growth, absence of which from the diet produces deficiency diseases, such as beriberi, scurvy, rachitis."

—*Dorland Medical Dictionary*

"Each vitamin should be studied on its own merits and with a mind not biased by presuppositions derived from what is already known regarding any other vitamin . . . the vitamins are not a naturally related group . . . Each vitamin is entirely specific in the sense that no one or combination of them can take the place of any other one . . . We shall do well to think of vitamins as nutrients, rather than as drugs. It is for the physician to decide when to employ vitamin concentrates as drugs, and how prompt and how great a pharmacological effect is to be expected from such preparations."

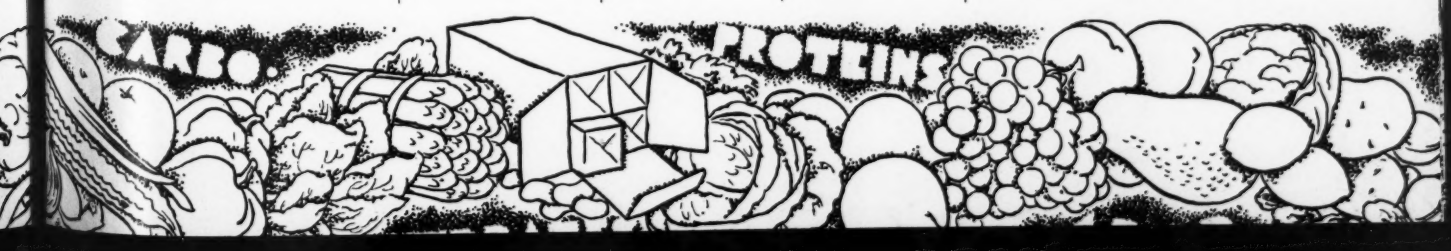
—Henry C. Sherman in *Food and Health.*

SOURCES			PROPERTIES	EFFECTS OF COOKING	ARTIFICIAL CONCENTRATES	ALLOWABLE CLAIMS AND STATUS OF VITAMINS (J.A.M.A. **106**:1733) (May 16, 1936) From the Reports of the Council on Pharmacy-Chemistry
PLANTS		ANIMAL				
Vegetables	*Fruits*					
a+ gus+ oke++ g++ es++ + oli+ ed uts+ ge+ t++ y+ d+ er+ + mber+ tion++ plant+ ve+ ze++ e oil+++ room fer- l++ oil+++ ey+++ ed++ dried+ er, n+ n+ to++ kin++ sh++ ch++ to++ p ns+++ e- +++ e at+	Apple+ Avocado++ Banana++ Canta-loupe++ Dates+ Figs+ Grapefruit+ Lemon+ Nuts+ Orange+ Peach+ Pineapple+ Prunes++	Butter++ Buttermilk+ Cod Liver oil+++ Cheese++ Cream+++ Egg yolk+ Fat++ Fat of glandular organs: Liver+++ Kidneys++ Fish livers+++ Fish oils+++ Fish roe+++ Halibut liver oil+++ Milk (whole)+++ Oyster (raw)++ Salmon (canned)+	Fat-Soluble Easily oxidized Heat stable in absence of air	Destroyed by high temperatures Destroyed by oxidation Not destroyed by ordinary cooking Apparently not generally destroyed by canning Scarcely affected by pasteurization	Halibut liver oil Cod liver oil Carotene NOTE: These products are transferred in the body to Vitamin A.	1. Characteristic eye disease (xerophthalmia) most common evidence of nutritional value of Vitamin A. Disease results from this deficiency. 2. Night blindness (nyctalopia). Vitamin A is specific in the treatment of this disease. Some cases do not respond. Reason: Undetermined. 3. a) As an aid to resistance to infections, Vitamin A has only been found to help "when there has been an exhaustion of body reserves of the vitamin and the ingestion of vitamin A is inadequate." b) It is not specific in prevention of colds, influenza, etc. c) Excess intake of Vitamin A has not been demonstrated to *prevent* infections. 4. Deficiency of Vitamin A retards growth when body stores are exhausted. Contributes to growth only in the sense that all vitamins and essential elements and nutrients contribute to growth. 5. "Inadequate evidence at present to justify claim that vitamin A will prevent renal calculi in man."

TE: THE GREENER THE PLANT THE RE "A."

GETABLES AND FRUITS THAT DO NOT NTAIN YELLOW PIGMENT (CARO-NE OR CAROTIN) DO NOT CONTAIN AMIN A. This pigment is hidden in the to- by the red pigment and in the green vege- s by the chlorophyl (*Steenbock*).

K AND GREEN LEAFY VEGETABLES E "PROTECTIVE FOODS" in all classifi- ns (*McCollum*).



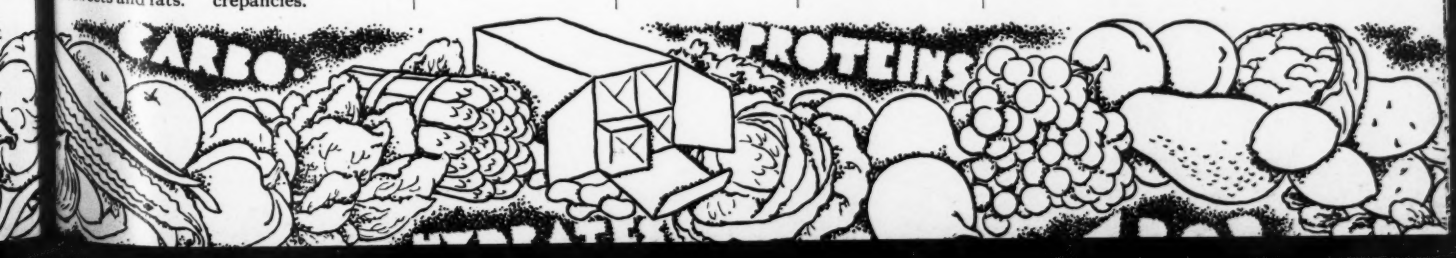
EAT TO LIVE

PART I: THE VITAMINS (Continued)

NAME	DESCRIPTIVE NAME	APPLICATION OF TERM	ASCRIBED FUNCTIONS	STORAGE	ASCRIBED RESULTS OF AVITAMINOSIS B C SYMPTOMS OF DEFICIENCIES OR ABSENC
VITAMIN B (Complex) Includes: (1) Vitamin B_1 (or F), and / or (2) Vitamin G (B_2), and/or (3) "Undifferentiated Vitamin B" [B (B_1) and G (B_2) and other alleged members of Vitamin B Complex] (4) Pellagra-preventing vitamin (P-P) NOTE: Crystalized antineuritic vitamin of Jansen and Donath is a nitrogenous compound of definite composition. "Vitamin G" belongs to flavine compounds. Value of flavines in pellagra is not established.	Antineuritic factor (B_1 or F) (Beriberi Preventive) Antipellagric factor (B_2 or G) (Sometimes called Vitamin P-P) NOTE: The two factors are independent. Formula: $C_{12}H_{16}N_4OS$	"The term 'vitamin B' should not be used loosely." "Ample evidence indicates that two or more physiologically active substances play a rôle in relation to numerous phenomena formerly explained in terms of vitamin B alone." [From: J.A.M.A. **106**: 1733 (May 16) 1936.]	Stimulates appetite. Prevents peripheral neuritic conditions. Relieves tic douloureux (B_1 concentrate). Factor in carbohydrate metabolism. Factor in determination of amount of insulin. Synergist. B_1 influences menstruation. *Therapeutic value in*: pernicious vomiting of pregnancy; tube feedings through a jejunal fistula. *Increased requirements in*: (a) influence on intestinal mobility; (b) Neuritis of various types; (c) hyperthyroidism; (d) infections. NOTE: The Council on Pharmacy and Chemistry has found experiments too early to permit advertising claims for these items.	Limited Required daily	B_1 or F: Impairment of loss of appetite: starvation fro of interest in food Disturbed digestion Impaired growth of young during lactation Amenorrhea Beriberi Polyneuritis Fatigue Alcoholic neuritis. B_2 or G: Pellagra and associated conditions. B_1 and B_2: Cessation of growth. NOTE: B_3, B_4, B_5, B_6; and Y have demons value only in pigeons or rats. F has been used by different writers note different things; and is therefor chiefly discontinued. It is mentioned for the sake of completeness.

SOURCES			PROPERTIES	EFFECTS OF COOKING	ARTIFICIAL CONCENTRATES	ALLOWABLE CLAIMS AND STATUS OF VITAMINS (J.A.M.A. 106:1733) (May 16, 1936) From the Reports of the Council on Pharmacy-Chemistry
PLANTS		ANIMAL				
Fruits						
Almonds++		Bacon + or ++	Water-Soluble	Easily destroyed	25 International Units per gram or per centimeter.	1. "Vitamin B_1 may be cited as of value in correcting and preventing anorexia of dietary origin in certain cases."
Apple+ or++		Beef++	Thermolabile B_1	Lost if water or liquid it is cooked or canned in is not used	Vitamin B from wheat germs rice polishings Brewer's Yeast	2. "Vitamin B_1 is of value in securing optional growth of infants and children."
Avocado+++		Brains++++	Destroyed by soda or alkali	More stable than Vitamin C		3. "Vitamin B_1 is of value in correcting and preventing beriberi."
Banana+ or++		Buttermilk	Refining removes vitamin	More stable in more acid foods		4. "Because vitamin B_1 is a dietary essential its administration in concentrated form is of value in some conditions where difficulty in utilizing ordinary foods in the usual way is encountered."
Brazil nuts+		Egg yolk++	Ultraviolet irradiation believed to destroy B and G	Stable in natural foods and in a dry state		5. At the present time other *definite* claims of therapeutic value of Vitamin B_1 cannot be recognized.
Butternuts++		Fish+	Probably somewhat destroyed by pasteurization	Quick drying less destructive than heating in moist condition		6. Daily requirement: 50 International Units for infants; 200, for adults.
Cantaloupe++		Fish roe++	Fairly destructive after extracted from natural foods	Destruction rate increases gradually with increasing temperatures		
Dates++		Ham++		Generally resists conditions of ordinary cooking		
Filberts++		Kidney++				
Grapes+		Livers++				
Grapefruit, fresh or canned++		Milk:++ whole scalded condensed evaporated dried, whole dried, skim fresh skim				
Hickory nuts++		Oyster++				
Lemons++		Sweetbreads+				
Oranges++						
Peach, raw+ or++						
Peanuts++						
Peanut butter++						
Pecans++						
Pears++						
Pineapple, fresh, raw, canned++						
Prunes++						
Strawberries+						
Walnuts++						
Watermelon+						

NOTE:
The plus or positive amounts of Vitamin B indicated here under *Sources* are strictly not the same for B_1 and B_2. These differences sometimes vary considerably; but enough variety is mentioned to compensate for discrepancies.



EAT TO LIVE

PART I: THE VITAMINS (Continued)

NAME	DESCRIPTIVE NAME	APPLICATION OF TERM	ASCRIBED FUNCTIONS	STORAGE	ASCRIBED RESULTS OF AVITAMINOSIS OR SYMPTOMS OF DEFICIENCIES OR ABSENCE
VITAMIN C	Cevitamic Acid or Ascorbic acid Antiscorbutic Formula: $C_6H_8O_6$	Therapeutic value of Vitamin C at present applicable only to scurvy.	Protects against scurvy. Metabolism requirement of bone. Requirement for formation and maintenance of teeth. Changes in the mouth. Necessary for normal nutrition.	Very limited Required daily	Scurvy. Decalcification of bones. TEETH ARE FIRST TO BE INFLUENCED SHORTAGE: Decay of teeth; Loosening and loss of teeth; Changes in dentine of teeth. Pyorrhea. Glossitis and atrophy of tongue. Loss of weight. Loss of appetite. Fatigue. Pallid complexion. Rapid heart. No resistance to infections. Bruise easily. Pains in joints.

SOURCES		PROPERTIES	EFFECTS OF COOKING	ARTIFICIAL CONCENTRATES	ALLOWABLE CLAIMS AND STATUS OF VITAMINS (J.A.M.A. 106:1733) (May 16, 1936) From the Reports of the Council on Pharmacy-Chemistry
PLANTS	ANIMAL				
Fruits Apple++ Apricots++ Avocado+ Banana++ Canta-loupe+++ Cherries++ Cran-berries++ Grapefruit, fresh+++ canned+++ Lemons+++ Limes++ Oranges+++ Peach++ Pear+ Pineapple, fresh++ raw++ canned++* Rasp-berry+++ Straw-berry+++ Water-melon+++	Liver+ Milk (variable) Cream (variable) Note: Although milk and cream are variable in their Vitamin C content, they are important as staple sources of this vitamin.	Water-Soluble Heat sensitive Easily oxidized Destroyed by drying Greatly destroyed by pasteurization; but this is no argument against pasteurization. Easily decomposed in presence of other substances; therefore should not be mixed without advice in administering.	Very easily destroyed because of oxidation Even cooking in a vacuum may destroy (*McCollum*) Alkali or soda destroys Sugar and water dilute At least partly lost if liquid in which cooked or canned is not used Citrus fruits and tomato do not lose Vitamin C by commercial canning or preserving in cold storage. (*Sherman*) Reason: High acidity; low protein content. Method of commercial vacuum canning. Boiled potatoes and stewed tomatoes seem to retain a small amount of the vitamin. Commercially canned foods almost the equivalent of fresh in most cases (*McCollum*)	International Unit: 0.05 mg. of 1-cevitamic acid (ascorbic acid). This is the quantity of 1-cevitamic acid usually found in 0.1 cc. of lemon juice. Food must have 250 units daily intake to have therapeutic value. Vitamin C from: Orange juice Lemon juice Cortex of suprarenals Ascorbic acid (crystalline Vitamin C)	1. Vitamin C acceptable for prevention and correction of scurvy. 2. Vitamin C acceptable for early and latent scurvy. Diagnosis depends on (a) roentgenologic evidences in long bones; (b) failure to excrete sufficient cevitamic acid in urine. 3. Dental caries, pyorrhea, certain gum infection, anorexia, anemia, undernutrition, infection—these are to be regarded as concomitant symptoms of possible vitamin C deficiency. They are not adequate indications in themselves. 4. Anti-infective claims are not yet recognized. 5. Dietary essential in infant feeding, not in treatment of disease except scurvy. 6. Optimum intake needed at all ages. 7. Weight disturbances, cessation of growth, anorexia, anemia, infections, nervous symptoms, hemorrhagic symptoms are not adequate advertising claims unless symptoms refer to substantiated Vitamin C deficiency.

*If not lost.

TE: All fresh vegetables and fruits; none ed fruit.

e estimated that the daily amount of vitamin ich a man must have to protect him from y is about the amount contained in one e of orange or grapefruit (raw or canned) ato, or canned tomato, or raw cabbage or , or in about one pound of cooked cabbage ato, or in a pint of milk; but instead of ce on any of these items the equivalent of al of them should be included in the daily y to ensure optimal nutritional well-being." man)

EAT TO LIVE

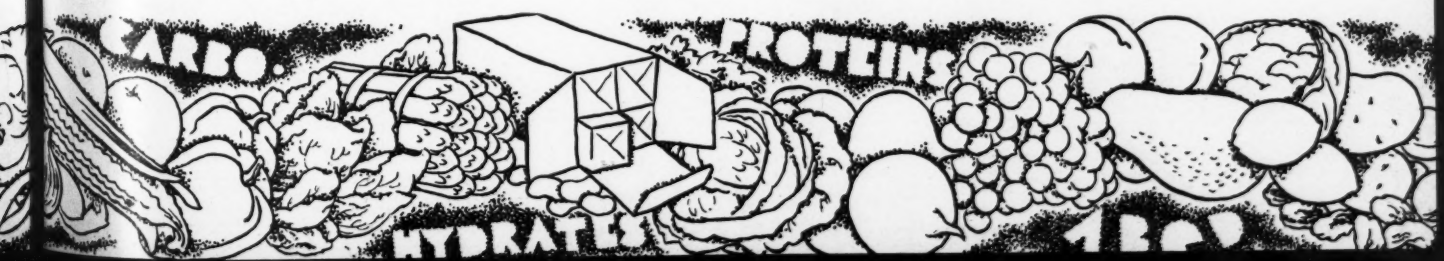
PART I: THE VITAMINS (Continued)

NAME	DESCRIPTIVE NAME	APPLICATION OF TERM	ASCRIBED FUNCTIONS	STORAGE	ASCRIBED RESULTS OF AVITAMINOSIS OR SYMPTOMS OF DEFICIENCIES OR ABSENCE
VITAMIN D (a Sterol)	Antirachitic Factor Formula: $C_{28}H_{43}OH$	"One or more substances which function in the proper utilization of calcium and phosphorus"	Regulates absorption and metabolism of calcium and phosphorus (bone forming elements). Regulates mineral metabolism. Required during pregnancy to prevent rickets in young.	Ergosterol found in large amounts in fat of skin activated by ultraviolet rays to Vitamin D.	Rickets (bone disease). Deformity of bones. Faulty absorption of calcium and phosphorus in body. Defects in teeth. Muscular weakness. Unstable nervous system. Retarded growth.
VITAMIN E or Vitamin X Status undetermined. Not recognized at present.	Antisterility Factor or Reproductive Factor	See Status of Vitamin E under "Allowable Claims, etc."	So far only demonstrated as necessary for rats, mice, and maybe hens.		Failure of reproduction.

SOURCES			PROPERTIES	EFFECTS OF COOKING	ARTIFICIAL CONCENTRATES	ALLOWABLE CLAIMS AND STATUS OF VITAMINS (J.A.M.A. 106:1733) (May 16, 1936) From the Reports of the Council on Pharmacy-Chemistry
PLANTS	SUNLIGHT	ANIMAL				
...ne oil ...haps)	Direct sunlight Ultraviolet light Foods irradiated with ultra-violet light (variable and sometimes tentative.)	Halibut liver oil +++ Cod liver oil +++ Other liver oils +++ Butter fat + (variable) Milk + (variable) Egg yolk + (variable) Salmon, fresh and canned ++ Clam, oyster ++	Fat-soluble Destroyed by too long a period of irradiation	Destroyed somewhat	Irradiated Ergosterol Cod liver oil Halibut liver oil	1. Specific in preventive and curative treatment of rickets, spasmophilia, and osteomalacia (diseases of abnormal calcium-phosphorus metabolism.) 2. Acute infections, renal or glandular disturbances may render treatment with Vitamin D ineffective. 3. Direct exposure to ultraviolet light or the sun results in formation of Vitamin D in the body; but claims that all effects that are beneficial are not recognized. 4. Important in tooth formation and maintenance, but claims that adequate Vitamin D intake will insure normal tooth structure and prevent caries have not been substantiated. 5. Vitamin D has a favorable influence on calcium and phosphorus metabolism. 6. Requirement: Greatest in infancy; apparently increased during pregnancy and lactation; otherwise undetermined.
...at germ ...egables		Milk fat Fresh meat	Fat-soluble Heat Stable	Not destroyed	Wheat germ oil	"The cooperative Committee (appointed by the Council on Pharmacy and Chemistry and the Committee on Foods of the American Medical Association) recommended that the Council declare that there is no evidence to indicate that vitamin E has therapeutic merit and that the Council do not accept any vitamin E preparations."

The following sources were consulted in this study:

1. Report of the Council on Pharmacy and Chemistry, J.A.M.A. **106**:1733 (May 16)1936.
2. Barborka, C. B.: Treatment by Diet, Philadelphia, J. B. Lippincott Company, 1934; Diet and Preventive Dentistry, J.A.D.A. **23**:977 (June) 1936; also, stenotype report of address before Chicago Dental Society, May 19, 1936.
3. Sherman, H. C.: Food and Health, New York, The Macmillan Company, 1934.
4. McCollum, E. V. and Becker, J. Ernestine: Food, Nutrition and Health Third Edition, rewritten, Baltimore, Published by McCollum and Becker, August, 1933.
5. McCollum, E. V. and Simmonds, Nina: The Newer Knowledge of Nutrition, New York, The Macmillan Company, 1929.
6. Clendening, Logan: The Balanced Diet, New York, D. Appleton-Century Company, 1936. Consulted but not quoted.
7. Encyclopaedia Britannica, Fourteenth Edition, 1936.
8. The Merck Manual, Sixth Edition, Rahway, New Jersey, Merck & Co., 1934.
9. Weston, William; Levine, Harold: Revised Vitamin Chart, South Carolina Food Research Commission, June, 1931.



JOSEPH J. TOLAN, D.D.S., M.S.
Milwaukee

FIG. 7, A
AGE 6 ½ YEARS

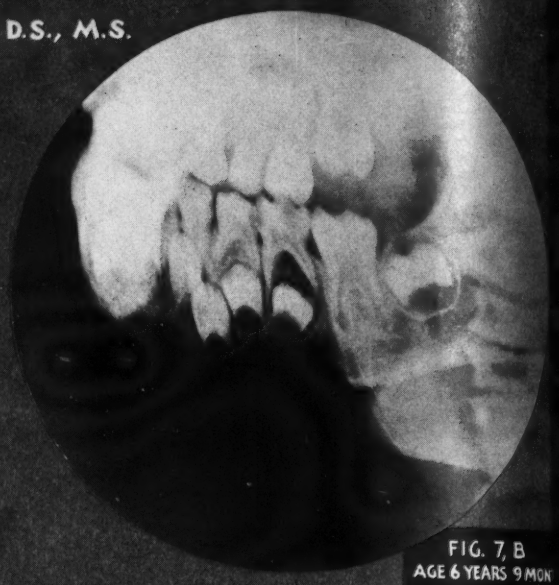


FIG. 7, B
AGE 6 YEARS 9 MON

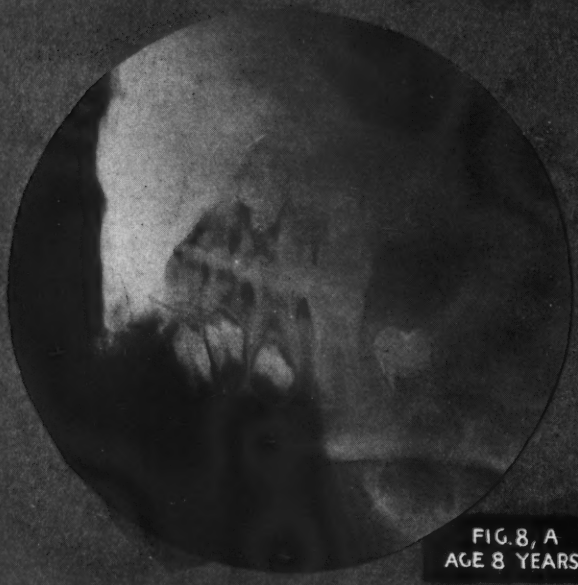


FIG. 8, A
AGE 8 YEARS

FIG. 8, B
AGE 9 YEARS

FIG. 9, A
AGE 11 YEARS

FIG. 9, B
AGE 12 YEARS

Fig. 7—A, Normal first permanent molar erupting; B, pathologic changes in the bifurcation of the second deciduous molar; D, too early loss of second deciduous molar causing drifting forward of first permanent molar. Compare D with Fig. 9, A, for ultimate result.
Fig. 8—A, Normal; B, no second bicuspid; C, deciduous cuspid; first and second deciduous molars are retained too long resulting in

(Read Across the Pages)

FIG. 7, C
AGE 7 YEARS

FIG. 7, D
AGE 7½ YEARS

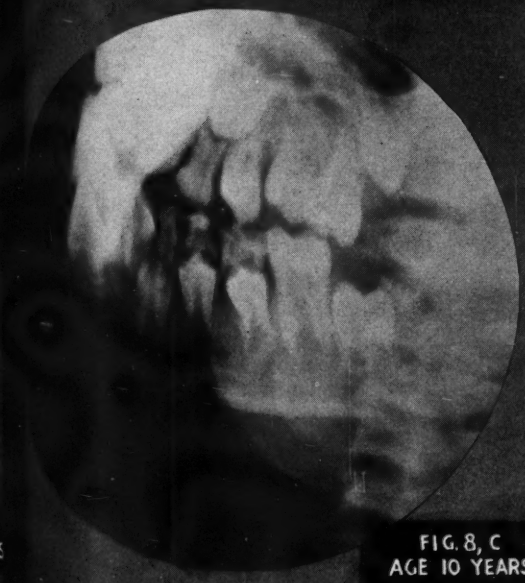


FIG. 8, C
AGE 10 YEARS

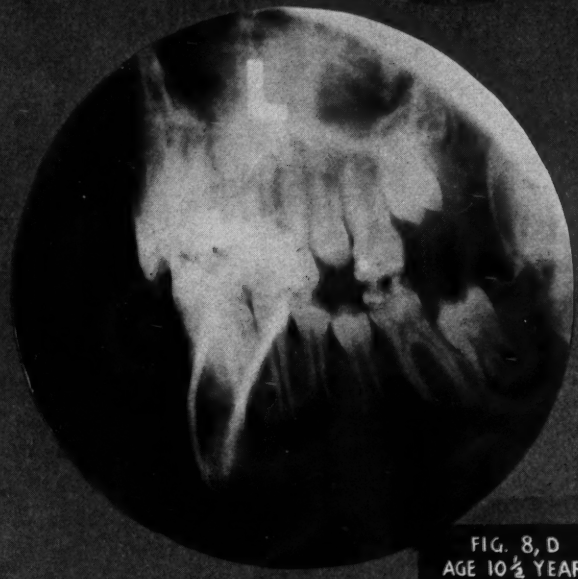


FIG. 8, D
AGE 10½ YEARS

FIG. 9, C
AGE 13 YEARS

FIG. 9, D
AGE 14 YEARS

pressure necrosis of bone about the crowns of the erupting permanent teeth; D, almost perfect; slight locking of second bicuspid. Note lack of closure of apexes of all but first permanent molar. Perfectly formed third molar cusps.

Fig. 9—Compare A with Fig. 7, D. The second bicuspid is firmly locked. B, Second deciduous molar should have been extracted. C and D are "normals."

(Read Across the Page)

FIG. 10 A
AGE 15 YEARS

FIG. 10, B
AGE 16 YEARS

FIG. 11, A
AGE 25 YEARS

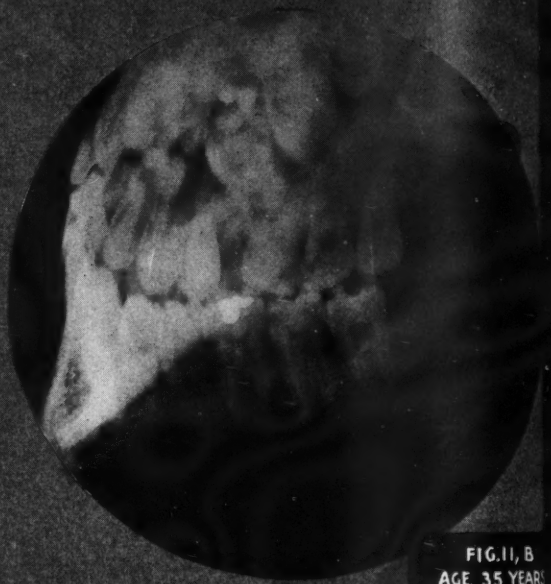


FIG. 11, B
AGE 35 YEARS

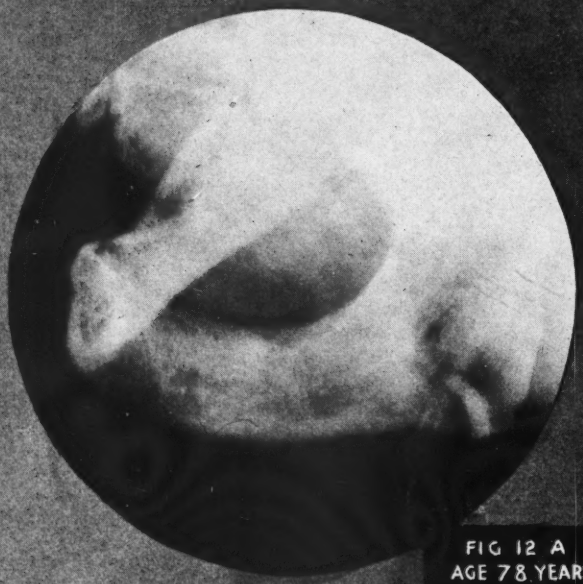


FIG 12 A
AGE 78 YEARS

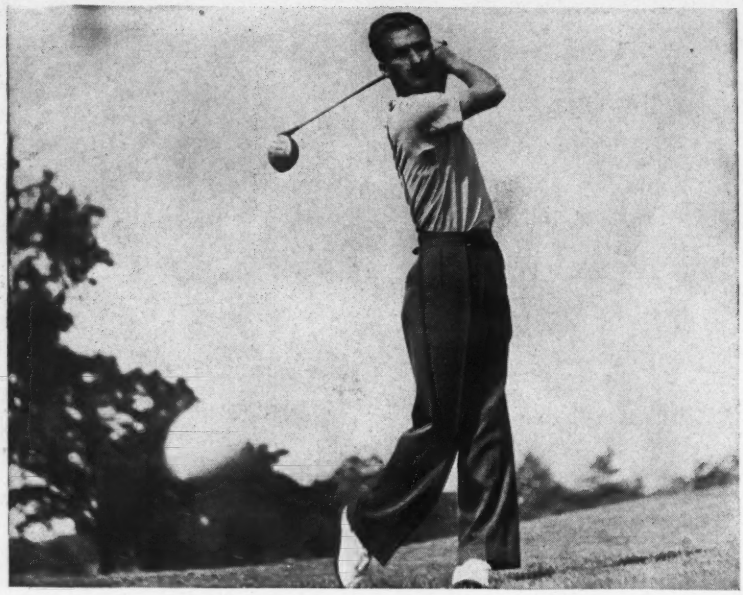
FIG 12 B
AGE 97 YEARS

Fig. 10—This group shows the third molar "swinging" into position. Note premature development in C and D with beginning marginal bone destruction.
Fig. 11—A, B, and C demonstrate retrogressive changes in the marginal bone. D, An edentulous jaw at 55 years.

(Read Across the Page)

Fig. 12—A, An edentulous jaw at 78 years. B, An interesting phenomenon: The patient, aged 97, had sixteen of his own teeth, which probably accounts for the lack of senile changes in the jaw angle.

(Read Across the Page)



Flexible Strength

In partial denture materials, shock-absorbing FLEXIBLE strength is absolutely necessary: ample strength without excessive rigidity in the clasps — perfect retention without the exertion of harmful forces on the abutment teeth. No less important is ease of melting and casting and the assurance that your case can always be added to or repaired easily, quickly and economically.

These desirable features are to be found in the golds which we manufacture and recommend for partial dentures, saddles, bars and clasps. Each of the NEY-ORO golds listed below is scientifically alloyed to provide these advantages in the most perfect combination possible.

NEY-ORO G-3	$2.07
NEY-ORO 5	1.89
NEY-ORO 6	1.71

(The above are all gold color)

THE J. M. NEY COMPANY
HARTFORD, CONN. CHICAGO, ILL.

IDEAL
FOR THE GENERAL PRACTITIONER
AND THE MAN WHO
SPECIALIZES

Dental Oral Surgery **really offers a postgraduate course in textbook form. It describes in complete detail the invaluable technique of the author, Doctor Wilton W. Cogswell. This is a book for the progressive man; it is ideal for both the general practitioner and the man who specializes. The price is $10. Order your copy at once.**

THE DENTAL DIGEST
1005 Liberty Ave. Pittsburgh, Pa.

ABOUT OUR CONTRIBUTORS

JAMES P. GLEASON received his D.D.S. in 1916 from the University of Buffalo. Doctor Gleason is a member of the American Dental Association, the Rochester Dental Society, and the Rochester Dental Study Club of which he has been group leader for five years in the Cast Gold Partial Denture Section. Doctor Gleason practices general dentistry.

HARRY H. ASHER, D.D.S. (1931); M.S. (1933), received both degrees from the University of Illinois. Doctor Asher has previously contributed to the dental literature on the subject of metallurgy. He is a member of the American Dental Association; American Institute of Mining and Metallurgical Engineers, and the British Institute of Metals, and has been teaching dental metallurgy at the University of Illinois College of Dentistry where he has likewise been conducting some research. In the preparation of the article appearing in this issue Doctor Asher received technical assistance from E. Svitenky, M. Allison, and M. L. Asher to whom the author acknowledges his gratitude. Doctor Asher has a general practice.

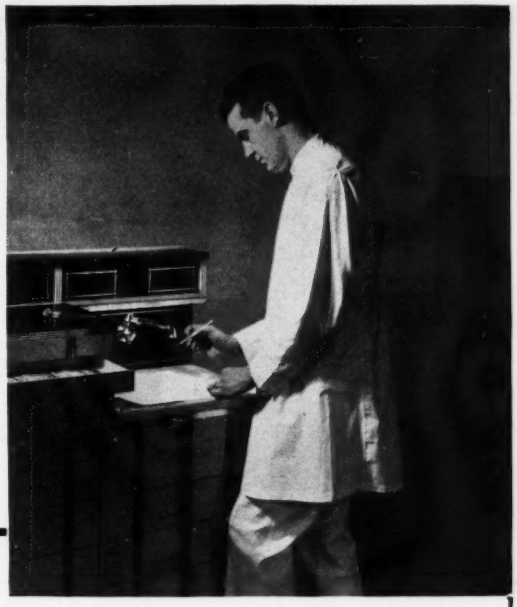
JOSEPH JAMES TOLAN, D.D.S. (University of Michigan, 1923; M.S., 1925) is a member of the American Dental Association and the Wisconsin Academy of Dentists. Doctor Tolan spent three years in the department of oral surgery at the University of Michigan Hospital under Doctor Chalmers J. Lyons. Doctor Tolan now specializes in oral surgery and exodontia.

TO THE EDITOR

There was a time in the era B. D. (before DIGEST) when many authors of articles appearing in dental magazines delighted in showing off their learning. They tried to do it by the use of involved language, complicated sentences, and an abundance of polysyllabic words. In order to pick the grains, if any, from the chaff, the hardy reader had to lock himself in a soundproof room with a couple of dictionaries at hand. THE DENTAL DIGEST was a pioneer in making authors who had something to say "come out with it" in a snappy, straight-to-the-point manner. The popularity of THE DIGEST attests to the soundness of the idea. Now, is there room for further improvement? I believe so, and since the only risk I am running is rejection of my proposition, I shall unburden myself.

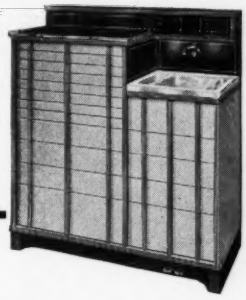
I have often thought it would be a good idea for most of the articles in

MORE CONVENIENCE FEATURES THAN ANY OTHER CABINET



• Extreme Right: Dentist at work at 144 Cabinet.

Right: American Dental Cabinet No. 144.



AMERICAN CABINET NO. 144•

Few Dental Cabinets can boast as many convenience features as the American Dental Cabinet No. 144. It includes the new automatic disappearing bottle rack, soiled towel compartment, electric illumination, electric outlets for headlamp, sterilizer and other apparatus, built-in wash basin with foot-operated faucet for hot and cold water.

These features added to the other well-known conveniences which American Cabinets pioneered, give you a combination of convenience, efficiency, and sanitation, in a cabinet of modern-classic design, which meets every demand of modern dentistry. Be sure to see the No. 144 before you choose any dental cabinet!

The complete American line, which includes the No. 144 Dental Cabinet pictured and described above, is illustrated in our new Dental Manual. To get a copy of this complete manual for your file, just fill in and mail the coupon below.

DENTAL EQUIPMENT is of value to the profession only when it serves as an AID to BETTER DENTISTRY . .

THE AMERICAN CABINET CO.
TWO RIVERS - - WISCONSIN

AMERICAN CABINETS DO SERVE as an aid to BETTER DENTISTRY . . .

American DENTAL CABINETS

SEND IN THIS COUPON TODAY . .

AMERICAN CABINET CO., Two Rivers, Wis.
Please send me a copy of the new American Catalog-Manual D-9-36
Dr. .....
Address .....
City ..... State .....

(*Or please use coupon on page* 334)

BUY *Tomorrow's Sterilizer* TODAY!

BEAUTY
•
EYE
VALUE
•
SAFETY

The Pelton "TRI-PLEX" *has everything*

THE PELTON TRI-PLEX means more to the modern office than the sterilizing safety it provides. To patients it is a symbol of security—a testimonial to modern methods and protection against infection or post-operative pain. The Tri-Plex is a beautiful and practical combination of autoclave, instrument sterilizer and cabinet. It includes the famous Pelton Automatic Autoclave, specially designed for office use, and the De Luxe 16" Instrument Sterilizer recessed into a cabinet with every modern feature. Complete details gladly mailed on request.

THE PELTON & CRANE COMPANY, DETROIT, MICHIGAN

ASK TO SEE THE *Pelton* TRI-PLEX

CAN BE PURCHASED ON THE ATTRACTIVE E.A.C. FINANCE PLAN

Quality plus Economy

Lee Smith Certified Alloy represents the utmost in quality. A high silver alloy, it is, as its name indicates, certified to exceed all A.D.A. specifications for amalgam alloys.

Yet the price an ounce is only $1.50 in five ounce bottles and is even less in larger quantities. Or five ounces of alloy with sufficient mercury for amalgamation may be purchased for $8.60.

Order through your regular dealer or use the coupon on page 335.

LEE S. SMITH & SON MANUFACTURING CO.
7325 Penn Avenue Pittsburgh, Pa.

dental magazines to be accompanied by short critical comments. These would call attention to the need of further elucidation of points which to the author may have seemed too obvious; note any apparent error of omission or commission by the author. This would not only benefit the reader, but it would give the author a chance to clear up misunderstandings. To illustrate my idea, I shall briefly review two or three articles appearing in THE DIGEST.

1. The Modified Jacket Crown:

The idea of building a tooth up to alinement is not new. It has been done by means other than a porcelain jacket. It is well known that the gum "takes kindly" to glazed porcelain, but can we impose on the gum to the extent of using *many* butted crowns, thus providing many uncleansable areas? The porcelain shelves may not irritate the gum, but what about the débris which accumulates on the shelves?

In justifying flat contacts the author states that round contacts are not necessary, since porcelain cannot decay. But is fear of decay the only reason for round contacts? What about irritation to the investing tissues of the teeth from food impaction?

2. Osteomyelitis:

"Pulse rate 100 . . . distressingly weak . . . clinical picture one of toxicity . . . no elevation of temperature . . . " What does the author mean by "clinical picture" when added to the other descriptive terms? "After adequate treatment was instituted the periosteum did become reattached." We are anxious to know what "adequate" treatment will bring about reattachment of periosteum. If he means heavy doses of iodides, foreign proteins, and salicylates, why not be more definite as to doses, strength, and physiologic action of these drugs? We would appreciate not only a report, but an analysis of the case and the reasons for handling it in a certain way.

3. Action of Drugs:

Aren't we overdoing it a bit when we try to teach our patients the action of the drugs we use? Is it not the result of an inferiority complex? Besides, what if a patient asks us the action of some drug which we do not know, although we use it? Why not establish classes for our patients and give them courses in other dental subjects?

Now, I am not a writer, and probably did it all wrong, but I believe it illustrates my idea.

—*S. Korol, D.D.S., Chicago.*

COLOR SURVIVES EVERY TEST

Test a Luxene Resinoid denture for natural color and translucency in any way you wish, and you will be more than pleased with the result. But, better still, you may confidently rely upon the permanence of this close simulation of healthy oral tissues in all of your dentures. Your most critical patients will be delighted with a Luxene Resinoid denture as even their closest friends will not suspect its presence.

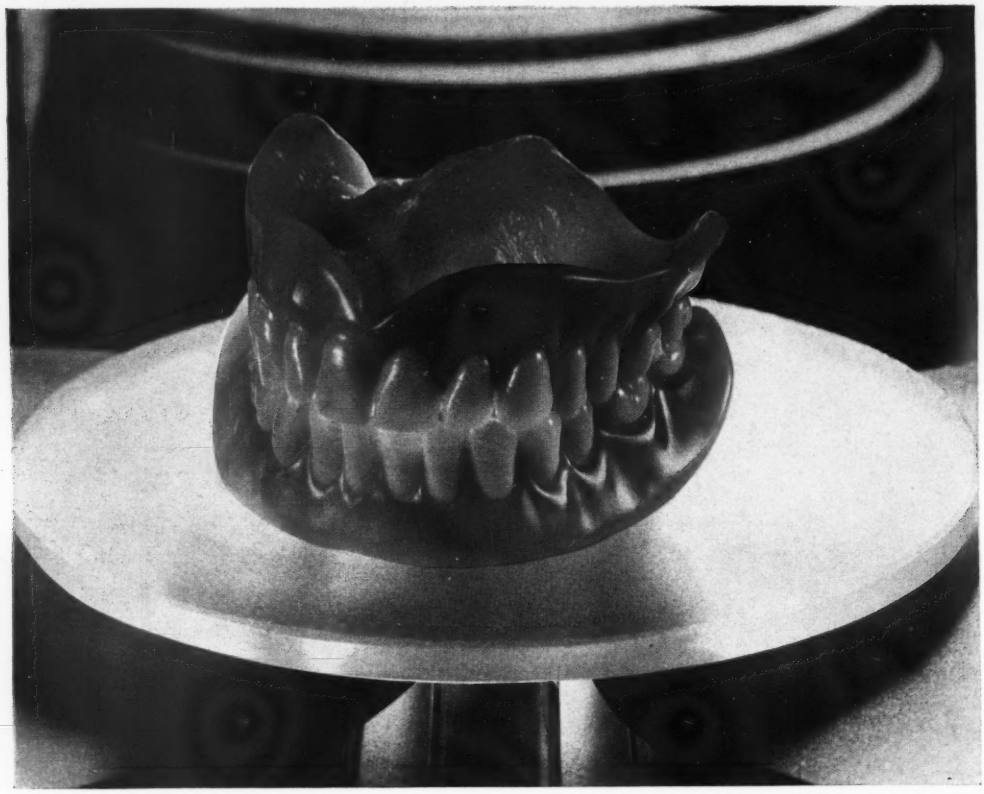
Another important advantage of Luxene Resinoid is its high resistance to all ordinary solvents—oils, fats, mild acids and alkalies—it is chemically stable to the attack of various substances taken internally. Being extremely dense and non-absorptive, it possesses an immunity to staining. Brushing Luxene Resinoid dentures twice a day with luke warm water and soap will keep them free from any surface discoloration.

On the back of this insert we briefly summarize twelve outstanding advantages of Luxene Resinoid, all of which are vouched for by the actual experience of thousands of dentists throughout the country. More detailed information is given in our 32-page illustrated booklet P, "The Story of Luxene Resinoid." Your request will bring a copy by return mail.

BAKELITE DENTAL PRODUCTS, Inc.
SUBSIDIARY BAKELITE CORPORATION
247 Park Avenue, New York, N. Y.

LUXENE

REG. U. S. PAT. OFF.



ORIGIN AND DEVELOPMENT OF LUXENE RESINOID

The discovery of phenol-formaldehyde resinoid by Dr. L. H. Baekeland twenty-eight years ago, opened up many avenues for creative laboratory research. This new resinoid, which was named Bakelite, became the base for several thousand new materials. It soon was evident that Bakelite resinoid possessed many properties long sought for in a denture material, but it required some twenty years of intensive laboratory research and continuous experiment to produce a denture material which was superior in all essentials.

This objective was attained in 1932, and the new resinoid material was called LUXENE.

Properties and Advantages of Luxene Resinoid

1. *Natural Color.* Its translucent pink is durable and closely simulates color and appearance of healthy gums.

2. *Strength.* It is tough, strong and resilient. A check of 35 thousand dentures showed only 1.7% breakage from all causes.

3. *Permanency of Form.* Once it is molded, cured and set the denture does not change its shape.

4. *Tissue Tolerance.* Authorities report that oral tissues are healthier under Luxene Resinoid Dentures.

5. *Absence of Absorption.* It is a permanently dense, homogeneous substance. No moisture can penetrate its lustrous surface.

6. *Odor and Taste.* It is odorless and tasteless. Non-absorbent, it cannot acquire either odor or taste.

7. *Permanent Adherence.* In the mold, it first becomes fluid, surrounds teeth and metal parts, and solidifies into an integral part of denture.

8. *Curing Time.* It cures in 2½ hours at 266° F. in an ordinary vulcanizer.

9. *Expansion and Contraction.* Mouth temperatures will not expand or contract the denture. There is no absorption so it neither swells nor shrinks.

10. *Length of Life.* Its strength and texture do not deteriorate. Original denture dimensions are permanent. Color is durable. It will last indefinitely.

11. *Cleanliness.* It is unaffected by oral secretions, acids, alkalies or alcohol. Soap and water brushing keeps denture hygienic.

12. *Ease of Repair.* Luxene Resinoid Repair is a special form which cures in less time and at lower temperature. Dentures may be rebased or repaired so perfectly that only the closest inspection can detect it.

BAKELITE DENTAL PRODUCTS, Inc.
SUBSIDIARY BAKELITE CORPORATION
247 Park Avenue, New York, N. Y.

LUXENE

REG. U. S. PAT. OFF.

A DENTAL DISCUSSION PROMPTED BY AN ARTICLE ON "NEURALGIAS AND EAR SYMPTOMS" IN THE MEDICAL LITERATURE

(*Continued from page* 299)

THE EXTERNAL AUDITORY CANAL.

There are numerous other articles on the subject written by dentists. It would seem that the dental profession has not been unaware of the results of traumatic injuries to the region in the glenoid fossa to closed bites.

COOPERATION BETWEEN PROFESSIONS

We of the dental profession are fortunate to have a physician of Doctor Costen's ability and standing summarize the observations of our dental investigators and add to it his own confirmation of this important subject. We hope it will stimulate thought among the medical profession and call attention to another important rôle of the dentist in the healing art.

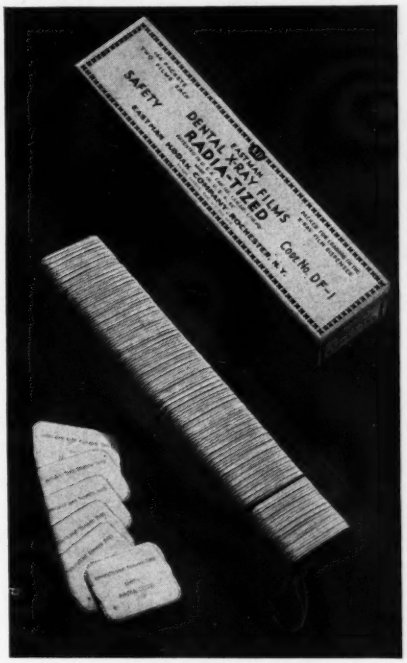
As one who has been interested in the problem of "opening the bite" for many years and in undertaking to reposition the mandible to relieve trauma in the glenoid fossa region, I wish to comment from the standpoint of experience. I am in complete agreement with Doctor Costen concerning the frequency of occurrence, the disorders, symptoms, diagnosis, and the tremendous necessity for treatment of disturbed function within the temporomandibular joint.

Rôle of Physician—The otolaryngologist's and the diagnostician's part in this field consists almost entirely in recognizing the symptoms of the disorder.

Rôle of Dentist—The tremendous problem imposed on the dentist is one of treatment which includes almost every skillful procedure of dental practice. It includes a knowledge of anatomy, roentgenology, orthopedics, pathology, all types of operative techniques, orthodontia, exacting methods of reproducing jaw movements on articulators, good judgment and plenty of experience, and the ability to anticipate various developmental changes which will take place as a

Radia-Tized Films Provide ... EVERY ESSENTIAL

... EXCLUSIVE ADVANTAGES



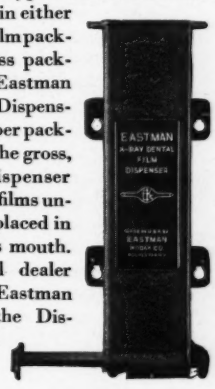
EASTMAN Radia-Tized Films are made with every technical characteristic to facilitate prompt, accurate x-ray examination. They are the most widely used periapical films—specified where highest quality radiographs are demanded.

Radia-Tized Films have an emulsion on each side of a *safety* base, giving two identical superimposed images which are protected by an abrasion-resisting coating. They provide adequate sensitivity ... brilliant contrast ... minute detail. They require only half the exposure time employed for the so-called "slow" films ... have considerably more latitude than the "fast" or "speed" types.

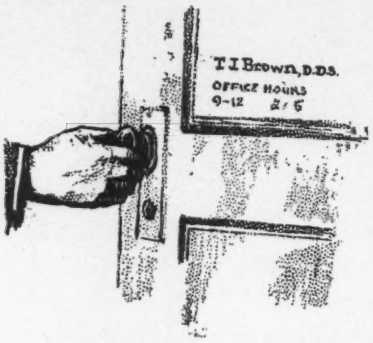
Single-Emulsion Films

Eastman C *Regular-Slow* and CC *Extra-Fast* Films are uniform, free from manufacturing defects. They have a *safety* base and a non-abrasive coating to protect the emulsion, and are supplied in flat, white, machine-made packets. Made especially for dental radiography and to meet Eastman standards of quality, they offer money- and time-saving advantages over ordinary films. Eastman Kodak Company, *Medical Division*, Rochester, N. Y.

THE most economical way to buy the three types of Eastman Periapical Films in either one- or two-film packets is in gross packages for the Eastman Dental Film Dispenser. The cost per packet is less by the gross, and the dispenser protects the films until they are placed in the patient's mouth. Your dental dealer can supply Eastman Films and the Dispenser from his stock.



EASTMAN SAFETY DENTAL X-RAY FILM

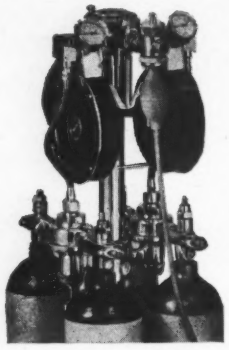


Do They Open Your Door With *Dread?*

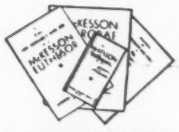
They try to be pleasant and courageous when they say, "Good afternoon, Doctor." But could you read their thoughts, how many of your patients would be looking forward to the next half hour with intense dread and apprehension?

Can you think of any other profession, or any craft or business that must dispose of its services against such resistance? It is not pleasant to contemplate that people think of dentistry in terms of pain. But it is true. And this is a world of realities.

Dentists' who have recognized this fact and have installed McKesson equipment for gas analgesia have seen the results of patient confidence written in their appointment books.



McKesson equipment is not expensive, nor is there any complicated technic in its operation. The Nargraf is designed for both anesthesia and analgesia. The Euthesor is designed for analgesia. Either type can be purchased on easy term payments. Get the McKesson facts and consider making a McKesson machine your next equipment investment.



McKesson literature will tell you more about this important subject. Return the coupon. There is no obligation.

McKesson Appliance Co.
Toledo, Ohio
Please send me literature on McKesson equipment.

Dr. .....

Address .....

City .....State.....

You will find another coupon on page 334

result of restored normal function to muscles and ligaments.

In surgery it is possible to make exploratory operations and to have the wound heal; also it is possible to place corks between the jaws and relieve pressure in the glenoid fossa temporarily; but this is not the cure. It is the permanently functioning jaw in its new relation and the permanent relief of the traumatized area that must be accomplished.

It is not infrequent to spend from 150 to 200 hours on each problem of this type which is completed. Many of these hours are spent in diagnosis and planning. Except in full denture construction the time element makes this type of dentistry almost prohibitive to the average patient who needs this treatment.

Specific Consideration of Doctor Costen's Article

1. The mere adding of overlays to the posterior teeth as Doctor Costen suggests to increase vertical dimension will soon mean traumatized teeth with their ultimate loss. He mentions opening the bite 3 mm. on the affected side and the resulting cure of a twenty-four year old parotid gland tumor. This would seem rather heroic from a dental standpoint, and we must wonder concerning the eventual stability of the teeth. We wonder how the physician arrives at the proper vertical dimension openings of 2 mm. or 3 mm. or 4 mm. to obtain the cure. It might be mentioned in passing that with each increase of opening the jaw functions differently. In diagnosing cases showing deep overbites, it might also be remembered that deep overbites are often normal for those persons.

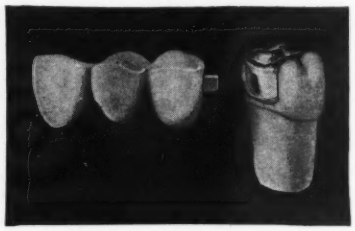
3. Doctor Sam E. Roberts of Kansas City, Missouri, in discussion compliments Doctor Costen for his work but feels that he is forced to be unethical and must refer patients from their family dentist to one who will correct bites according to his (Doctor Roberts') diagnosis. It would no doubt be rather a shock to a conservative practitioner of dentistry to have referred back to him by an otologist a former patient, with instructions to increase the vertical dimension on the

You can do it BETTER if you do it with PORCELAIN

by Lochhead

★

Set in the minds of many dentists is the outmoded thought that porcelain for extensive bridgework has a very limited application. Today, this is no longer true. Illustrated here are two of the more popular types of cases for which dentists today in increasing numbers are choosing porcelain in preference to other materials. Have you discovered yet the greater satisfaction which porcelain offers your patients? Lochhead will be happy to see you off to a good start.



A porcelain bridge designed to fit an abutment with a gold inlay WITHOUT THE USE OF SEPARATE ATTACHMENTS, thereby saving you the cost of these extra attachments.

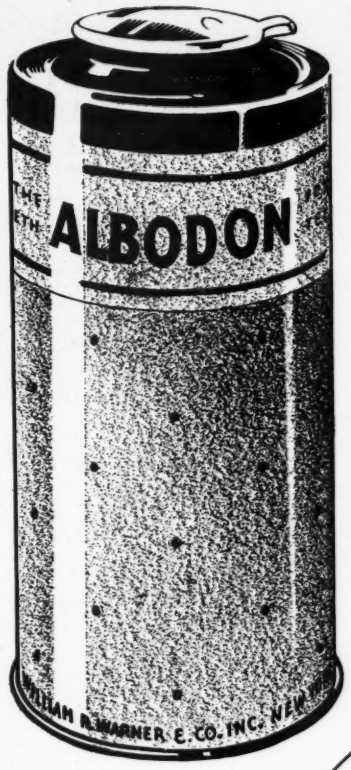
★ ★ ★

A six-unit porcelain bridge. Actual tests in the mouth have proved their greater strength as well as their remarkable naturalness.

★

Lochhead Laboratories, Inc.

NEW YORK, N. Y. 115 West 45th Street	CINCINNATI, OHIO 939 Enquirer Building
BOSTON, MASS. 120 Boylston Street	LOS ANGELES, CALIF. 512 Hillstreet Bldg.
CHICAGO, ILL. 25 East Washington St.	MONTREAL, CANADA 1414 Drummond St.



FOR THE TEETH

Not just a dentifrice but a better dentifrice because it incorporates the good qualities modern research has made available for safer and more efficient dental cleansing. Albodon contains sodium perborate, sodium bicarbonate and sodium chloride in experimentally determined proportions, in a colloid base that keeps the ingredients together and prevents scattering of the powder. Truly a fine dentifrice, deserving of professional recommendation. Available in two sizes.

ALBODON

WILLIAM R. WARNER & CO., Inc.
113 West 18th Street - - New York City

- small, firm but s-p-r-e-a-d-a-b-l-e rubber cup
- contacts every tooth surface; reaches neck of tooth under free gum margins
- gentle to patient; no exposed metal to contact tissue, only pliable rubber which cannot injure
- rapidity of operation
- full protection to handpiece
- costs only 60c per doz.

- perfected for cleansing small adult and children's teeth
- differ from widely used BS Polisher only in size
- same qualities that make the BS Polisher the finest prophylaxis cup available today
- costs only 60c per doz.

A Special Prophylactic Kit (worth $4.10) complete with assorted polishers, mandrels, sticks, tray, medicator, is available at the introductory price of $2.50 while they last

- short angle permits easy access to all surfaces where proximity of soft tissue makes access difficult with other mandrels
- used with BS Polishers it prevents grit from entering the handpiece
- accurately designed
- ideally constructed
- when ordering please specify your style of handpiece
- cost is negligible; only 10c each, $1.05 per doz.

YOUNG DENTAL MFG. CO. 4958 Suburban R.W. ST. LOUIS MO.

Coupon

Gentlemen: Kindly send me FREE sample of BS POLISHERS.
Dealer's Name .....
Dr. .....Address .....

(*Or please use coupon on page* 335)

FOR UNIVERSAL USE in DENTAL CEMENTATION

Smith's Cement is an oxyphosphate of zinc cement offering advantages for every dental cementing operation.

For crown and bridge work—adhesive, smooth working, quick setting, minimum film thickness.

For fillings—relative insolubility, resistance to mouth fluids and abrasion, high crushing strength.

For germicidal action—contains copper silicate, an efficient germicide which does not cause discoloration.

By using Smith's Cement in your practice you will find there is no other cement so truly universal. You can obtain it from your regular dental dealer.

LEE S. SMITH & SON MFG. CO.

7325 Penn Ave., Pittsburgh, Pa.

left side, say 4 mm. and on the right side 2 mm. A conservative dentist knows that an inlay in slight supra-occlusion will make a lame tooth, and is not anxious to take the case, because he always has first in mind the idea of saving teeth.

4. The pressure effect on the eustachian tubes in edentulous mouths, which is mentioned at the beginning of Doctor Costen's article, is rather difficult to visualize. Doctor Gillis[10] of Hammond, Indiana, who has taken many roentgenograms of condyles in his practice of denture prosthetics, shows how with complete closure of edentulous jaws the head of the condyle instead of being jammed farther into the glenoid fossa rather rides away from there and curls up toward the articular eminence. It would seem that perhaps the ear difficulty might be accounted for by a relaxed *tensor veli palatini* muscle.

It has been my observation that most full dentures are constructed immediately to the bite and centric relation which the patient presents before the extraction. An example of this would be a case for extraction and dentures, with natural teeth locked to a deep overbite, the jaw settled to one side owing to a unilateral loss of teeth. The usual procedure among modern dentists is to construct dentures with little if any cusp interference. It does not require an imagination to see why in a year or less the denture patient may be biting forward and to one side and the former centric relation be entirely changed. My opinion is that the natural teeth locked the jaws for many years in such a way that in order to chew it was necessary to slide the jaw back and slip to one side. To be sure there had been traumatic injury in the fossae region owing to lack of support and pressure, relaxed ligaments and muscles as well.

By releasing the occlusal lock which the natural teeth presented and replacing dentures with no cusp or jaw interference; by giving support in the molar region and chewing surfaces, the muscles and ligaments in time take on tone and develop accord-

[10]Gillis, R. R.: Roentgen Ray Study of the Temporomandibular Articulation, J. A. D. A. 22:1321 (August) 1935.

She expects you to *know!*

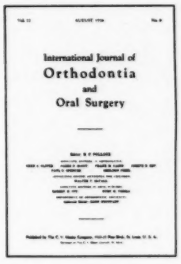
Her query might be about dental care for her little boy, or orthodontic correction for the girl who is entering school, or perhaps a question regarding an oral surgery case.

The fact that she is your patient presupposes her confidence in you. *She expects you to know.* You can justify and sustain this confidence only by *knowing.* And there is more than prestige that accrues from having a broad knowledge of your profession. It is profitable, too.

The International Journal of Orthodontia and Oral Surgery is designed for the practitioner who is not content with knowing about general operative dentistry. It is a dependable guide for the man who recognizes the practice building advantages of children's dentistry; who looks upon oral surgery as a part of dentistry entirely within his realm.

The Journal is the only publication of world-wide importance devoted to Orthodontia. It represents the eleven societies of America and Europe active in Orthodontia. Under the editorship of Dr. H. C. Pollock and Doctors Oren A. Oliver, James D. McCoy, Frank M. Casto, Joseph D. Eby, Paul G. Spencer and Sheldon Friel, it assures you complete coverage of Orthodontia.

Dentistry for Children is ably covered in the Journal under the direction of Dr. Walter T. McFall. His contributions will prove invaluable to you in caring for your juvenile patients.


International Journal of
Orthodontia
and
Oral Surgery

The Department of Oral Surgery is headed by Doctors Robert H. Ivy and Kurt H. Thoma. With the assistance of most of our outstanding oral surgeons, they are gathering and making available to you helpful information on all aspects of Oral Surgery. You may look to the Journal for ways and means of detecting roentgenograms; recognizing malignancy; extracting teeth; and performing all types of oral surgery.

The twelve issues, published annually, contain approximately 1200 pages and 2000 illustrations. They include a record of practically every important development and improvement made during the period in Orthodontia, Dentistry for Children, and Oral Surgery. They belong on your bookshelf! The Journal covers its field authoritatively and completely. It's published for you. Avail yourself of this opportunity to subscribe.

Books That Build *Prestige* and *Practice*

ESSENTIALS OF ORAL SURGERY

Vilray P. Blair and Robert H. Ivy.
Second Edition. 602 pages, 445 illustrations. Price, about $6.50. Ready October 1st.

This new edition is intended to bring up to date the recognized advances that have been made in the surgery of the mouth and jaws. Many chapters have been practically rewritten. Valuable collaboration has been afforded by Dr. James Barrett Brown, especially in dealing with surgical principles, and by Dr. V. H. Kazanjian, of Harvard University, who has supplied a new chapter on surgical preparation of the mouth for artificial dentures.

PRACTICAL ORTHODONTIA

By Martin Dewey, D.D.S., M.D., F.A.C.D.

Revised by GEORGE M. ANDERSON, D.D.S., Professor of Orthodontia, Baltimore College of Dental Surgery, Dental School, University of Maryland. 5th Edition—514 Pages—586 Illustrations—Price, $8.50.

Starting with the first chapter, devoted to the principles of orthodontia, the subject is treated progressively through twenty-five chapters, thus giving the reader the etiology and principles involved before demonstrating the actual treatment of cases. Fixed and removable appliances are clearly described in both their construction and application. The treatment of cases is carried through step by step from beginning to end.

PRACTICAL PEDODONTIA

Floyde E. Hogeboom, Professor of Children's Dentistry, College of Dentistry, University of Southern California. 328 pages, 249 illustrations. Price, $6.50.

Children's dentistry is a phase of practice the general practitioner can ill afford to neglect. Children of today grow up and become the fathers and mothers of tomorrow. Many important advances have been made in this field of dentistry. The newer methods of handling juvenile cases are discussed in this book which thoroughly covers the subject, including deciduous teeth, cavity preparation, root canal work, endocrinology, and public health dentistry.

DENTAL PHARMACOLOGY AND THERAPEUTICS

J. R. Blayney, B.S., D.D.S., M.S., Professor of Dental Pathology and Therapeutics, University of Illinois, College of Dentistry. 2nd Edition, 338 pages, 25 illustrations. Price about $4.50. Ready October 1st.

Therapeutics and pharmacology as applied to dental practice are of increasing interest to the dental profession. Dental drugs and their uses are presented in a new and concise manner in this volume. It is a discussion of the drugs of particular interest to the dental practitioner. The pharmaceutical descriptions of chemicals and drugs, and their preparations and doses, are in conformity with those given in the latest editions of the U. S. Pharmacopoeia and the National Formulary.

ORAL SURGERY

By Sterling V. Mead. 1,087 Pages, 403 Illustrations. Price $12.50.

This book brings oral surgery well within the range of possibilities of the average dentist. It is more than a comprehensive presentation of the subject. It is a step-by-step guide. Every operation is described in its progressive steps. Having this guidepost in oral surgery means opening additional avenues of work and income. Therefore, it is an indispensable addition to the library of every forward-looking dentist.

THE C. V. MOSBY COMPANY **DD-9-36**
3525 Pine Blvd., St. Louis, Mo.
Gentlemen: Send me the following items marked with an (X), charging my account.

- ☐ International Journal of Orthodontia and Oral Surgery (Published Monthly) Subscription price for 1 year..... $7.00
- ☐ Blair-Ivy "Essentials of Oral Surgery"..... About $ 6.50
- ☐ Dewey-Anderson "Practical Orthodontia"..... $ 8.50
- ☐ Mead "Oral Surgery"..... $12.50
- ☐ Blayney-Dental Pharmacology & Therapeutics"..... About $4.50
- ☐ Hogeboom "Practical Pedodontia" $6.50

Dr..... Address.....

(Or please use coupon on page 335)

"A Dental Contribution to Preventive Medicine"

WHEN Dr. N. S. Jenkins an American dentist read his now famous paper—"A Dental Contribution to Preventive Medicine" before the Dental Society of Europe in 1908, he gave to the dental and medical professions a formula whereby the patient could combat the deleterious action of mouth bacteria and at the same time cleanse and polish the teeth without the slightest injury to the mouth tissues.

In describing the action of this formula Dr. Jenkins said: "The problem of cleansing the teeth was comparatively simple. The two indispensable ingredients were precipitated chalk and soap.

"In approaching the question of destroying the micro-organisms which breed so abundantly, I will not weary you by recounting the long process by which I came to the selection of the disinfectants. By disinfectant is meant that which is not only antiseptic, but also germicidal and inhibital to the growth of bacteria. You will observe that each of these ingredients except chalk, has a distinct antiseptic or disinfectant value, but it was in their combination that I found disinfectant power such as I had hoped for, but, until my experiments were ended, had scarcely dared to anticipate.

"Its powerful germicidal effect is largely due to the solvent action of the soap and its allies on the envelopes of the bacteria which enables the germicides to do their work directly upon the germs. Not only does it destroy, but it inhibits the growth of bacteria to such a degree that I have ventured to give it the ambitious name of KOLYNOS (Greek: Disease Preventer). I know of no other combination of disinfectants which, without impairing the resistant power of the tissues, accomplishes such results."

92

ing to their previous disuse, and the jaw tends to return to its normal position, thus also relieving pressure in the glenoid fossa. This is an important point to consider when a patient presents symptoms of condyle intrusion and resulting symptoms, and is basic so far as diagnosis is concerned.

The Problem

To determine the amount of change from the normal is the problem. There are many ways of diagnosing this deviation from the normal. When the normal jaw position or centric relation is found there will be no condyle pressure. This is the position in which all teeth, muscles, and ligaments are functioning freely and in complete balance. The ability of a diagnostician and operator to distinguish between the abnormal and the normal positions is one that cannot be measured by so many millimeters here or so many there. There is no set rule.

Procedure

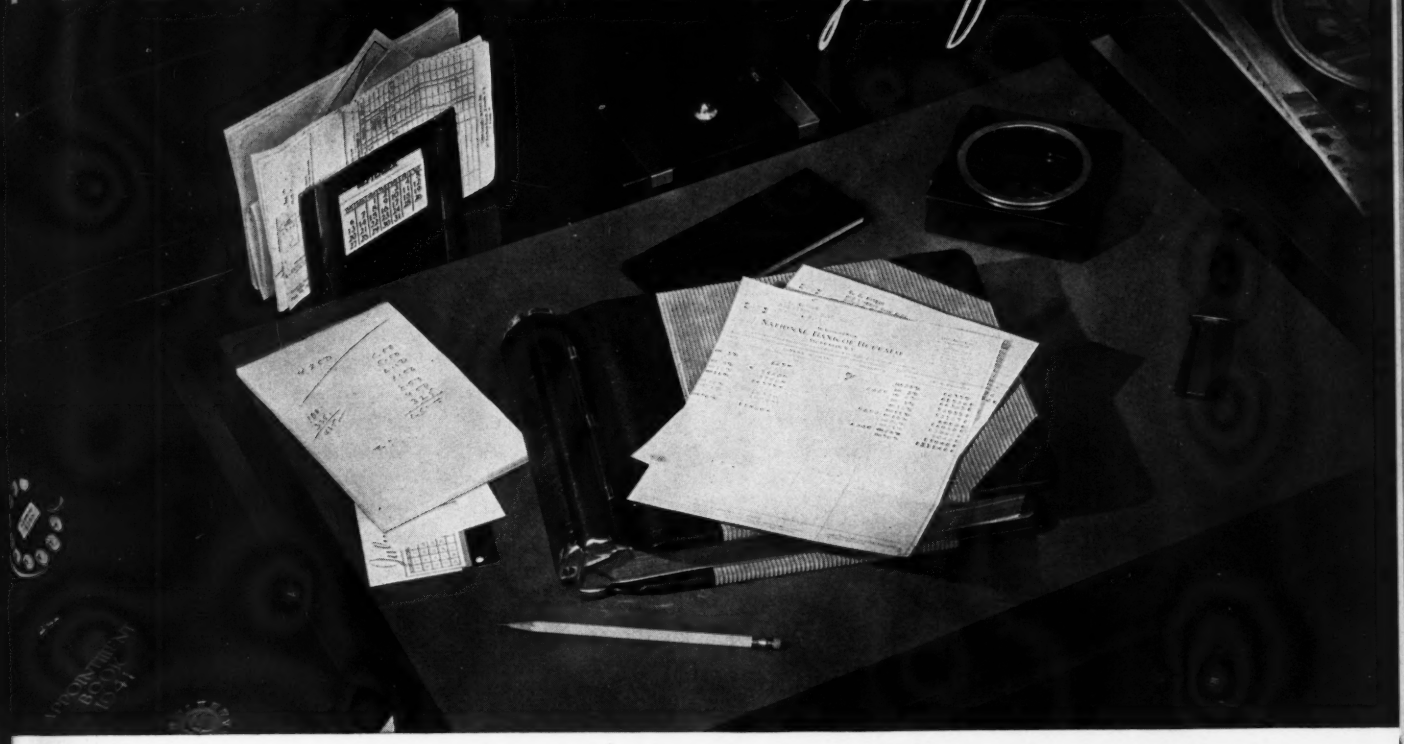
It is my practice to give the natural and edentulous jaw complete freedom of motion in all movements with no interference. Locked jaws are freed, support is given in edentulous areas, and Nature does the rest. It is my opinion and conclusion that given freedom and the natural development of ligaments and muscles Nature will not tolerate the condyle intrusion. This is, of course, a slow process, six months or perhaps a year, but it works. It is conservative. When the jaw has finally located itself there will be no problem of traumatic occlusion to consider in making final restorations.

Even the correct amount of vertical dimensions has not seemed so important as the release of the occlusal lock and the natural adjustment to the correct physiologic rest position (or normal centric).

Roentgenologic Aid

It has been my custom to take a roentgenogram of the region of the glenoid fossa in all cases with any reflex symptoms, obvious malocclusions, or evidences of closed bites. These roentgenograms show virtually the same thing that Doctor Wendell

YOUR INCOME 5 *years from now...*



WILL IT BE MORE OR LESS?

What does the future hold for you, Doctor? Will your practice continue to grow . . . become increasingly profitable each year? Or will your present practice decline and few new patients be attracted to replenish it? These are questions which only you alone can answer.

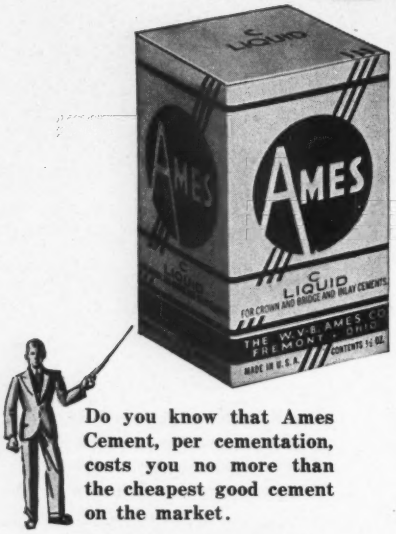
By far the wisest plan is to prepare for the future now . . . to take the steps necessary to keep your office up-to-date without further delay, for there is no greater practice building factor than an office which is modern in every detail. Nor is it difficult to keep your office modern.

Progressive modernization . . . the replacement of obsolete equipment one or two pieces at a time . . . places you under no financial strain. Yet this plan permits you to have a completely modern office within a comparatively short time.

Look about your operatory. Which item of equipment is most obsolete . . . creates the least favorable impression . . . subtracts from your efforts to attract a better-paying, more profitable class of patients? Decide to replace it without delay . . . and to consult your Ritter Dealer who will gladly explain the details of Ritter's Deferred Payment Plan and show how easily and economically you can assure your future prosperity now. RITTER DENTAL MANUFACTURING COMPANY, INC. RITTER PARK, ROCHESTER, N. Y.

Step-By-Step Modernization enables you to have a complete Ritter Office like this in a comparatively short time.

MODERNIZE YOUR OFFICE *Step by Step with* **Ritter**



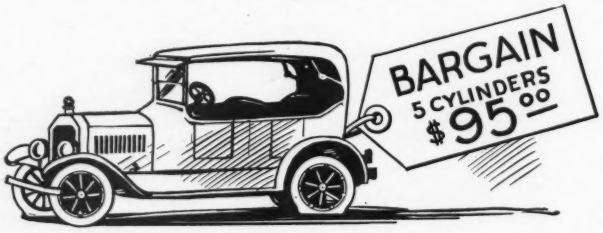
Do you know that Ames Cement, per cementation, costs you no more than the cheapest good cement on the market.

A good reputation and a profitable practice are built us by a preponderance of favorable factors in daily clinical usage. Success often depends as much upon the materials used as upon knowledge and skill.

Neither Ames Cement nor any other cement will assure popularity and wealth to any dentist, but it is significant that leading dentists are the most consistent users of **Ames Cements.** The W. V-B. Ames Company, Fremont, Ohio.

AMES DENTAL CEMENTS

The coupons on pages 334-335 are for your convenience when writing to advertisers



BARGAINS ARE NOT ALWAYS determined by price alone. Some mounted points are selling at a ridiculously low price because they can't compete with fast, cool cutting, non-glazing, economical SILTEX DENTSTONES. Don't judge mounted points by price alone, for output determines the cost of the points. And remember—

No dentist ever regrets using

SILTEX DENTSTONES

The fast cutting, true running, dependable, mounted points

G. Scott of St. Louis mentions in his discussion of Doctor Costen's article: (1) the erosion of the anterior and superior aspect of the condyle involved; (2) a narrowing of the joint space; (3) that the condyle of the involved side may move considerably farther forward on the eminence than on the normal side.

In addition it is observed that in side slips from the median line of the mandible the head of the condyle seems to be bent forward anteriorly on the most traumatized side. Inasmuch as there is always found a definite space posterior to the head of the condyle even in some of the worst cases of trauma, it is thought that the piling up of soft tissue has this bending effect on the condyle head. In cases in which there is considerable acquired disto-occlusion and snapping jaws, especially in cases of abraded molars, it can be expected that the jaw may snap even more after the bite is corrected and cause the operator and patient considerable worry. This seems to disappear gradually, perhaps because the condyle head bends back slightly during the muscular development which in time takes place.

Immediately after the correction of the bite is made the condyle head rides close to the eminence. In a year or so, however, it may be back in its former location, but the teeth and jaw will still be forward. Pains and aches may increase temporarily; ears may "pop" and crackle; however, if jaws are allowed freedom and Nature assists there is almost certain success.

Caution

All ear pains, deafness, and other related symptoms are not caused by closed bites. The operator must be certain that the diagnosis is correct before work is started. It is a dangerous venture and untold harm to the patient will result if mistakes are made. No excuses will be tolerated by the patient who loses teeth because of experimentation, especially if the pains and discomforts are not cured.

Summary

1. We are indebted to Doctor Costen for presenting to the medical

So that **MORE MAY BENEFIT** *from the service of dentistry . . .*

WE WOULD LIKE every dentist to read the lay advertising of Squibb Dental Cream and Squibb Tooth Powder. This advertising appears in all the leading national lay magazines.

We are endeavoring to impress upon the public the fact, well-known to the profession, that most tooth decay can be prevented. We are offering a plan for the care of the teeth—a plan which includes the recommendation that daily home care should follow the advice of the dentist.

It is our definite conviction that this advertising will reach many people who do not fully appreciate the benefits which progress in dental science has placed within their reach.

We frankly solicit your cooperation in this common objective.

Both Squibb Dental Cream and Squibb Tooth Powder contain milk of magnesia as the acid-neutralizing ingredient.

E·R·SQUIBB & SONS, NEW YORK

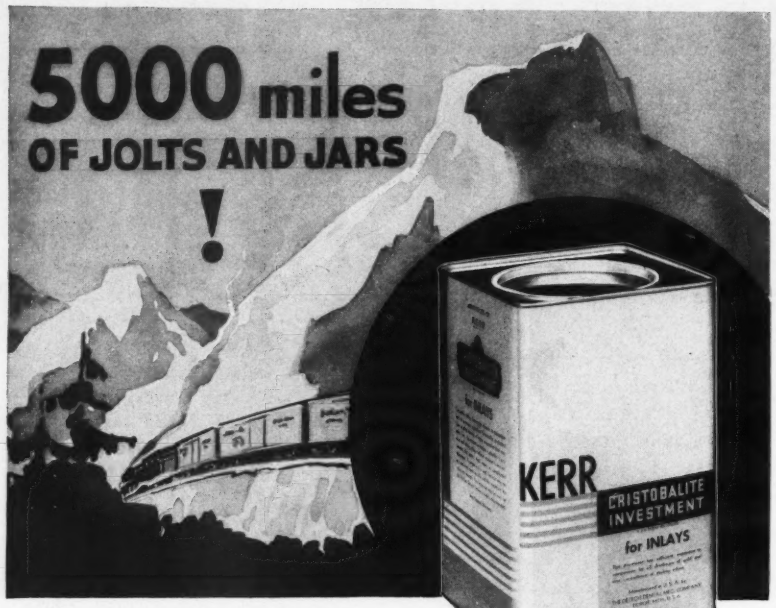
THE PLAN WE ADVOCATE:

1. Go to your dentist and follow his advice. This will include the kind of toothbrush to use, and how to use it; what kind of dentifrice to use, and what kind not to use; and whether you should supplement your own home treatment with the use of dental floss and oral perborate.

2. Check your diet with your physician or dentist—to be sure your system is getting the elements essential to the health and strength of your teeth.

3. Brush your teeth thoroughly, at least twice a day, and be sure you use a dentifrice scientifically prepared to clean teeth effectively, and safely.

The Priceless Ingredient of Every Product is the Honor and Integrity of its Maker



but NO SEPARATION

FROM Detroit to the Pacific and back, the Detroit Testing Laboratory, specialists in testing products, shipped by freight two drums of Kerr Cristobalite Investment, bearing their own special seals.

Five thousand miles of jolts, jars, jounces and shakes! Three solid weeks of rolling, pitching and bumping, including changes of cars!

Seals unbroken, these drums returned eventually to the laboratory. Their chemists carefully tested contents of both drums, *top* and *bottom*. "Perfect condition" was the verdict. *"Absolutely no separation."*

We could have confidently foretold the result. So could almost every experienced Dentist. Kerr Cristobalite Investment never separated for you—nor for anyone else. It is the one Investment outstanding for that merit. Also, it dips easily from the container, needs no costly packing system, and produces, year after year, castings *that fit.*

This spectacular test merely confirms your faith in a preparation that will continue to serve you well.

DETROIT DENTAL MFG. CO.

KERR CRISTOBALITE INVESTMENT

REG. U.S. PAT. OFF.

TOOLS THAT LAST

Tweezers which come into direct contact with corrosive acids or an open flame should be of Stainless Steel.

We offer four types, one of which is illustrated here, and suggest your interest in these tools because of their durability, fine finish and excellent workmanship.

SPECIFICATIONS AND PRICES

GS. 6" Slide Lock	$1.00	JS. 6" Plain	$ .90
KS. 4¾" Slide Lock	.90	DS. 4¾" Plain	.75

BUFFALO DENTAL MFG. CO., Kehr & Urban St., Buffalo, N. Y.

profession the possibilities of correcting headaches, ear involvements, and related disturbances by relieving pressure of the condyle in the region of the glenoid fossa. His investigations and results obtained from the standpoint of otolaryngology show us how interrelated and far-reaching are the results of loss of occlusal support of the mandible.

2. Many articles have appeared in the dental literature on this subject and are readily available; these articles have been written almost exclusively by dentists.

3. These ailments described can be cured by orthopedic and operative dental procedures. These procedures must be preceded by complete diagnosis and absolute evidence of the necessity of treatment, for dentists dare not make mistakes.

4. The technical methods call for the highest degree of training, preparation, good judgment, and complete understanding of the subject.

5. Only a correction back to normal will be successful.

6. Nature will aid if given a chance after locked bites are relieved and muscular balance is obtained.

7. Roentgenograms of this region aid in diagnosis.

8. Dentists should be conservative and not rely on snap judgments, but confine attempts at treatment within the bounds of established and proved dental techniques.

636 Church Street.

•

COMING:

ELECTIVE LOCALIZATION OF BACTERIA IN FOCI OF INFECTION

•

A DIET PROBLEM IN DENTAL PRACTICE- OVALTINE SOLVES IT

THE dental patient frequently presents a serious diet problem, and looks to you for advice. After extensive extractions or other operative treatment, mastication of solid food is difficult and adequate nutrition must be supplied by a semi-soft or liquid diet.

OVALTINE is valuable at such a time. It provides a highly nourishing, digestible and extremely palatable liquid food. Taken regularly before or between treatments, it helps build up the rundown patient and prepare him for further operative treatment.

Helps Build Sound Teeth

Three cups of OVALTINE made according to directions provide practically the full daily requirement of calcium and phosphorus, as well as a rich supply of Vitamin D to aid in the utilization of these minerals.

Nervous Insomnia

The recuperative value of rest and sleep to the dental patient is obvious. OVALTINE, taken as a warm drink before retiring, usually encourages sound, healthful slumber without the need for sleep-inducing drugs.

The Coupon Brings You Professional Samples

•

Send it in together with your letterhead, card or other indication of your professional standing, and samples of OVALTINE *will be sent you.*

The offer is limited to practicing dentists.

THE WANDER COMPANY, 180 No. Michigan Ave., Chicago, Ill. Dept. D.D.9

Please send me, without charge, samples of OVALTINE for distribution to my patients. Evidence of my professional standing is enclosed.

Dr. .....

Address .....

City ..... State .....

Canadian subscribers should address coupons to A. Wander, Ltd., Elmwood Park, Peterborough, Ont.

OVALTINE

The Swiss Food-Drink

Now made in the United States

(Or please use coupon on page 335)

COLUMBIA READY-MADE
Stone Study Model Bases

A REAL incentive to use study models, because they make the making of "presentable" study models easy. Just pour in plaster and mount the anatomical casts. No finishing, no carving; occlude automatically.

Study models let patients see their mouths as you see them.

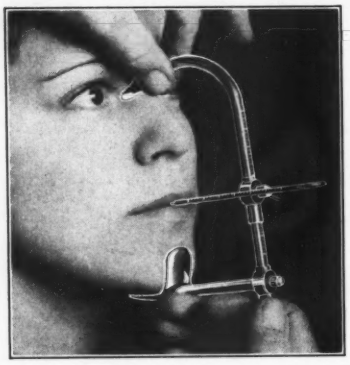
Send 20c for sample set—upper and lower
LITERATURE ON REQUEST

COLUMBIA DENTAL & X-RAY CORP.
131 East 23rd Street, New York, N. Y.

—Tried, Proved and—

RECOMMENDED

By Dentists in all the States of the Union and in many Foreign Countries



The Dento-Profile Scale

Obtains accurate invariable pre-extraction measurements of all facial dimensions concerned in denture construction.

So simple, a complete graph can be recorded on the indexed record charts in five minutes.

Space Limits Expressing Many Uses of the Scale

Solves quickly the correct opening of the bite for edentulous and old denture cases without previous records. Why guess at this important factor in denture construction. Checks loss of vertical dimensions in denture patients.

Scale and Charts sent on approval through your dealer. Literature on request. Price of Scale, Binder 25 Charts, $7.50.

Use coupon on page 335 Please

DENTO-PROFILE SCALE CO.
Fond du Lac, Wisconsin

THE PUBLISHER'S NOTEBOOK

THIS month, THE DENTAL DIGEST's companion publication, *Oral Hygiene,* appears in a new format characterized by more spacious pages; deeper margins; a crisp, clean type dress; and a new and heavier cover. Beyond these physical changes, the magazine is identical with the old *Oral Hygiene.* It will continue to be devoted to the human side of dental practice, the problems of dental life, a policy which has been pursued ever since the journal was founded more than a quarter-century ago.

Among the articles featured in the September issue, perhaps the most unusual is "Redesigning Your Reception Room," written by a dentist's wife and illustrated by an interior decorator. Detailed cost estimates are presented.

Doctor Seth W. Shields, of Indiana, tells in "If I Were President" what he would do for the promotion of dental health. Appropriately, his article is followed by one revealing the growing concern with which members of the dental and medical professions in Missouri are watching the efforts of federal agencies to develop programs for health care. They have a number of objections to the federal plans so far presented. In a similar vein, Doctor M. Henry Jossem contributes "Mr. Rorty in Search of a Martyr," dealing with the fallacies of socialized dentistry and medicine.

"San Francisco Notes," also featured in September, presents highlights of the A.D.A. meeting there. Another special feature in this issue, "Nine Months After Hartman," is contributed by five members of the profession from as many sections of the country. The authors are Doctor Edgar H. Keys of Saint Louis; Doctor Walter H. Jacobs of New York City; Doctor David Bennett Hill of Salem, Oregon; Doctor L. B. Dillon of Birmingham, Alabama; and Doctor Neill W. Macaulay of Columbia, South Carolina.

MERWIN B. MASSOL, *Publisher*

HU-FRIEDY

Leads Again - - - - -

The ORAL SUN LIGHT

A headlight with the brilliancy of the sun conveyed to the orifice of the mouth. Economy in maintenance and durability in construction are added features of this very efficient illuminating equipment.

A cool lamp has been provided for by the two cylinder reflectors, both of which are open spaced, with the spaces overlapping each other, so as to confine the light, and still maintain ventilation.

A ground optical lens covers the opening of the cylinders. This will condense the focus, which concentrates the actual candle-power of the bulb. The focus is adjustable, in the same manner as that of a telescope.

A soft leather band, cushion padded, renders comfortable carriage when in use.

The complete equipment consists of ten feet of rubber covered wire cord, and a transformer, which operates on A. C. only. Additional cord can be furnished upon request. Furnished on ten days' trial—price —$15.50.

The bulb is of standard type, as used in automobiles, and retails for 25 cents.

HU-FRIEDY MFG. CO.
3118 N. Rockwell St., Chicago, Ill.

Name .....
Address .....
City ..... State .....
Dealer .....

SUGGESTIONS TO CONTRIBUTORS

PUBLICATION PREROGATIVE: Articles and illustrations are accepted for publication on condition that they are contributed solely to this magazine.

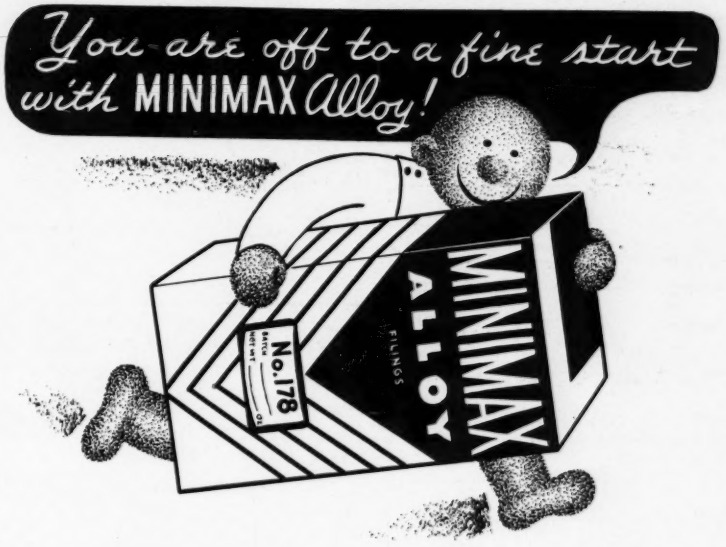
COPYRIGHT: All articles and illustrations appearing in THE DENTAL DIGEST are covered by copyright in the name of THE DENTAL DIGEST, Incorporated. Permission will be granted on request for the reproduction of text or illustrations in reputable publications (and other noncommercial purposes) of anything appearing in the pages of THE DIGEST if proper credit is given.

MANUSCRIPTS: Manuscripts should be typewritten, double-spaced, and the original, not the carbon copy submitted. Footnotes and bibliographies should have a definite connection with the article and should be specifically referred to in the article. To be of value to readers, bibliographic references should contain complete information in the order given: name of author, title of article, name of periodical, with volume, page, month—day of month if weekly—and year. In the case of books: name of author, title, edition, volume, place of publication, name of publishers, year, pages. Manuscripts should not be rolled.

ILLUSTRATIONS: Drawings and photographs should be plainly numbered on the backs according to the sequence in which reference is made to them in the article. The author's name should be written on the back of each illustration, and in case of possible doubt, the word "Top" to designate the top of the illustration. In the case of roentgenograms, the negatives are preferred for reproduction; in the case of photographs, glossy prints about 12 by 8 inches in size. Line drawings should be made in black on white paper that does not blot. Color work must be of a particularly high quality to be acceptable. All illustrations should be clear and distinct and large enough so that details will not be lost if reduction in size is necessary.

EDITING: Authors should not feel that they are being discriminated against or personally criticized when changes are made in the wording or spelling of their manuscripts or if parts are deleted. A minimum of editing is necessary in all cases—if for no other reason than to make grammatical corrections, and sometimes one article will require more revision than another. The reason for this is obvious. Every magazine has its peculiar style in matters of arbitrary spelling, in its general tone, in its form of presentation. The DIGEST favors a compact, terse, simple style, with outlining wherever possible, and many illustrations. Wordy, padded articles, with extraneous and irrelevant matter and florid writing will necessarily undergo considerable editing to make them conform to our style of succinct, *purposeful* writing. It is, however, at all times the aim of the editors to preserve the author's meaning and to help him make that meaning clear; the editing is not done for standardization as such.

ANONYMITY: Anonymous manuscripts and communications will not be read.



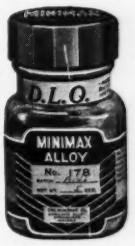
●Choose Minimax Alloy No. 178 and you are off to a successful start. Minimax assures those qualities which every dentist expects of an alloy—but does not always get.

The responsive action of Minimax Alloy No. 178 *in your hands* obviates disappointments. You will find that under the varying conditions within the wide range of amalgam technics it *continues* to provide high crushing strength, definite resistance to flow, retention of the greatest essential to successful fillings—proper expansion.

Millions of serviceable fillings with Minimax Alloy No. 178 give testimony to its satisfying qualities. Be critical of the alloy you use: then, we are confident you will choose Minimax!

The MINIMAX COMPANY
Medical & Dental Arts Bldg., Chicago, Ill.

Minimax



You Get More	—You Pay Less
Filings suitable for alloy-mercury gauges.	1 oz. bottle.....$1.60
Complies with Revised (1934) A.D.A. Specifications No. 1.	5 oz. bottle..$1.50 per oz.
	10 ozs.....$1.40 per oz.
	20 ozs.....$1.35 per oz.

What Guarantees a Superior Denture?

No one thing, of course. But users of Dr. Kelly's Impression Paste find that perfecting their impressions with this new material does away with most of their former grief and goes far toward insuring superior results. The new ready-mixed Paste in tube form makes setting speed easy to control; causes no smarting; stays soft on the slab for long periods; hardens quickly in the mouth. At dealers, $2.50. Try it; we guarantee your satisfaction. Kelly-Burroughs Laboratory, Inc., 143 N. Wabash Ave., Chicago, Ill.

USE "KELLY'S" PASTE

See second cover D.D.9

GENERAL ELEC. X-RAY CORP. DEPT. H49
2012 JACKSON BLVD., CHICAGO, ILL.

Please send full particulars concerning CDX.

Dr. .....

Address .....

Dealer .....

See page 289 D.D.9

WERNET DENTAL MFG. CO.
882 THIRD AVENUE, BROOKLYN, N. Y.

Please send free supply of Wernet's Powder mentioned in ad.

Dr. .....

Address .....

City .....

See page 291 D.D.9

WEBER DENTAL MFG. CO., CANTON, OHIO

Send complete particulars concerning the Weber line of equipment.

Dr. .....

Address .....

Dealer .....

See page 293 D.D.9

WISCONSIN RESEARCH FOUNDATION
MADISON, WISCONSIN

Please send free booklet mentioned in ad.

Dr. .....

Address .....

City .....

See page 294 D.D.9

BRISTOL-MYERS COMPANY
19 S WEST 50TH ST., NEW YORK CITY

Please send sample of Ipana to—

Dr. .....

Address .....

City .....

See page 319 D.D.9

AMERICAN CABINET COMPANY
TWO RIVERS, WIS.

Please send me a copy of the new American Catalog-Manual D9-36.

Dr. .....

Address .....

City .....

See page 320 D.D.9

PELTON & CRANE CO., DETROIT, MICH.

Send complete details concerning the Pelton Tri-Plex please.

Dr. .....

Address .....

Dealer .....

See page 322 D.D.9

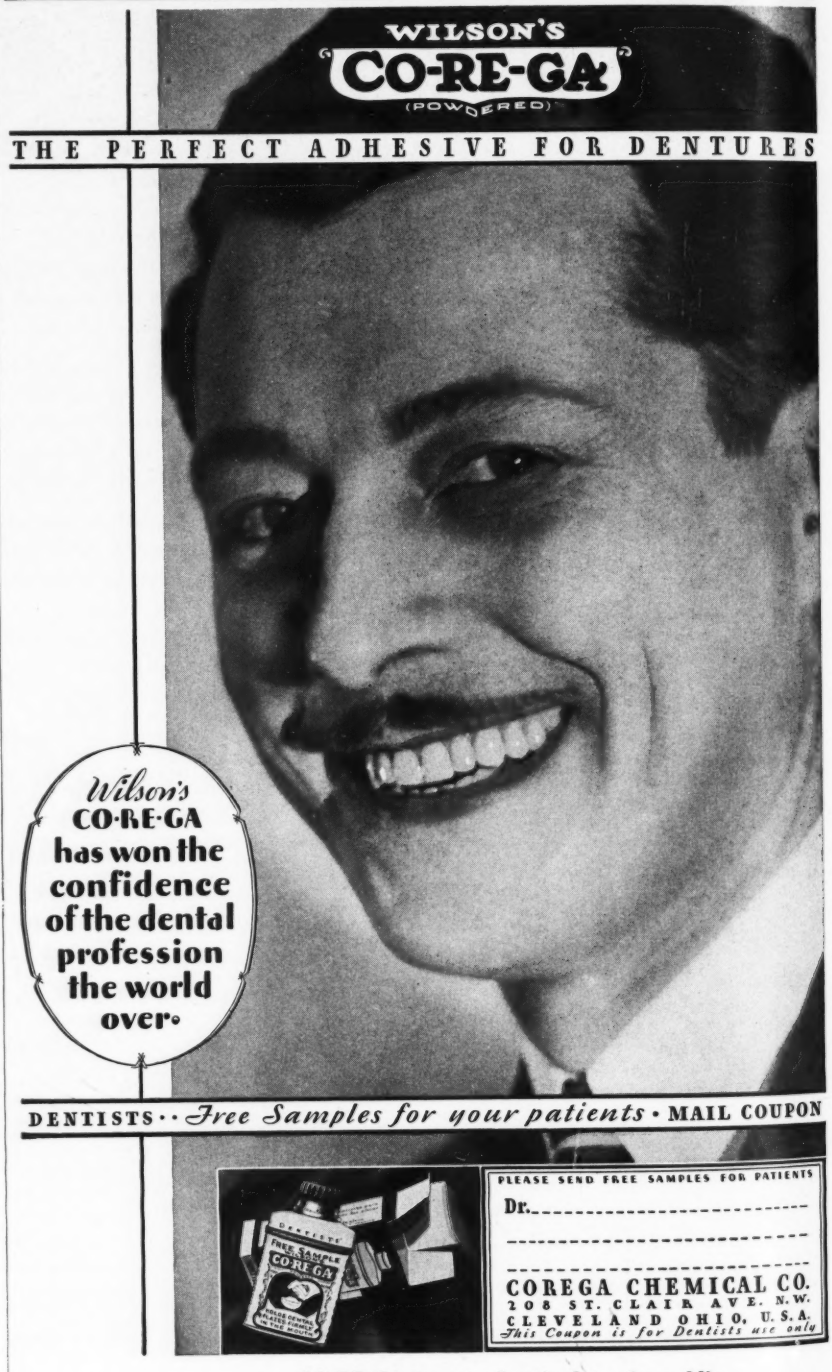
MCKESSON APPLIANCE CO., TOLEDO, OHIO

Please send literature on McKesson Equipment.

Dr. .....

Address .....

City .....


WILSON'S
CO-RE-GA
(POWDERED)
THE PERFECT ADHESIVE FOR DENTURES
Wilson's CO·RE·GA has won the confidence of the dental profession the world over.
DENTISTS · · Free Samples for your patients · MAIL COUPON
PLEASE SEND FREE SAMPLES FOR PATIENTS
Dr.
COREGA CHEMICAL CO.
208 ST. CLAIR AVE. N.W.
CLEVELAND OHIO, U.S.A.
This Coupon is for Dentists use only

CO-RE-GA is not advertised to the public

LARODON 'Roche'

for dental pain and tenderness

After extraction or other dental work to give much-needed relief of pain or tenderness. In most cases a few doses will be sufficient. Larodon (phenyl-dimethyl-isopropyl-pyrazolon) is not a narcotic.

Available in tablet form, in boxes of 10 and bottles of 100. A convenient form for pain-relief in headache, neuralgia, rheumatism, colds, sore throat, dysmenorrhea, post-extraction soreness, gingivitis, and toothache.

Nearly every drug store stocks Larodon also in powder form for extemporaneous prescriptions.

MAKERS OF MEDICINES OF RARE QUALITY

HOFFMANN-LA ROCHE · INC ROCHE PARK · NUTLEY · N. J.

See page 324 D.D.9

YOUNG DENTAL MFG. CO.
4958 SUBURBAN R. W., ST. LOUIS, MO.

Kindly send me a FREE sample of BX Polisher.

Dr. .....

Address .....

Dealer .....

See page 325 D.D.9

C. V. MOSBY COMPANY
3525 PINE BLVD., ST. LOUIS, MO.

Please send me the following books

.....

.....

.....

Dr. .....

Address .....

City .....

See page 332 D.D.9

COLUMBIA DENTAL X-RAY CORP.

131 EAST 23RD ST., NEW YORK CITY

Please send literature mentioned in ad.

Dr. .....

Address .....

City .....

See page 332 D.D.9

DENTO-PROFILE SCALE COMPANY
FOND DU LAC, WIS.

☐ Please send Dento-Profile Scale and Charts on approval. ☐ Send literature.

Dr. .....

Address .....

Dealer .....

See page 331 D.D.9

THE WANDER COMPANY
180 N. MICHIGAN AVE., CHICAGO, ILL.

Please send me, without charge, samples of Ovaltine for distribution to my patients. Evidence of my professional standing is enclosed.

Dr. .....

Address .....

City .....

See page 333 D.D.9

KELLY-BURROUGHS LABY.
143 N. WABASH AVE., CHICAGO, ILL.

Please send full particulars concerning Kelly's Paste.

Dr. .....

Address .....

City .....

See insert D.D.9

BAKELITE DENTAL PRODUCTS, INC.
247 PARK AVENUE, NEW YORK CITY

Send booklet "P" mentioned in ad.

Dr. .....

Address .....

City .....

See page 320 D.D.9

LEE S. SMITH & SON MFG. CO.
7325 PENN AVE., PITTSBURGH, PA.

Please send me:

One five ounce bottle Lee Smith Certified Alloy at $7.50.

One alloy-mercury combination (five ounces alloy with sufficient mercury for amalgamation) at $8.60

Dr. .....

Address .....

Dealer .....

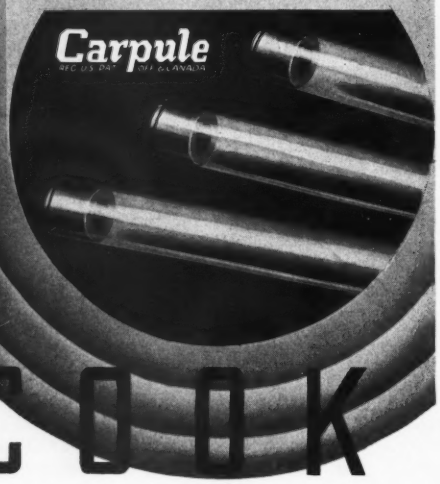
The Recommendation OF YOUR PATIENTS . . .

THERE are many ways to promote patient-recommendation, but one that can undoubtedly contribute to a dentist's reputation for skill among his patient's, is the judicious use of local anesthesia.

And, the dentists who realize the utmost from local anesthesia, know that the judicious selection of local anesthetic solution plays an important part in their success.

They are the dentists who want to be certain of the efficiency and safety of the solution . . . the ability and responsibility of its manufacturer. Many of them prefer a Novocain-epinephrin solution or Novocain with Cobefrin in Cook "Carpule" cartridges.

Note: It is the use of a normal saline vehicle that anesthetic solutions (Cook) differ from those available in R. B. Waite cartridges and ampules.



COOK

COOK LABORATORIES, INC.
170 Varick, St., New York, N.Y.
Laboratories: Rensselaer, N. Y.

Novocain, Reg. U. S. Pat. Off. & Can., Winthrop Chemical Co. Brand of Procaine HC1.

A RECORD OF *Performance* . . . .

WHY have anesthetic solutions (R. B. Waite) enjoyed the confidence of thousands of dentists the world over for forty-five years?

The best answers to this question may be procured from users of anesthetic solutions in R. B. Waite cartridges or ampules. They have confidence in their efficiency. These users will have had practical experience with them at the chair and have proven their high margin of safety. They are aware of the manifold features of the compound vehicle* not found in any other solution available.

All these comprise a record of performance that fully justifies the confidence placed in anesthetic solutions (R.B.Waite) and which can be reflected in your own local anesthesia.

---

*If you are not familiar with the properties of the base or vehicle used in Novocain-epinephrin solutions or Novocain with Cobefrin (R.B.Waite), we invite your inquiry.

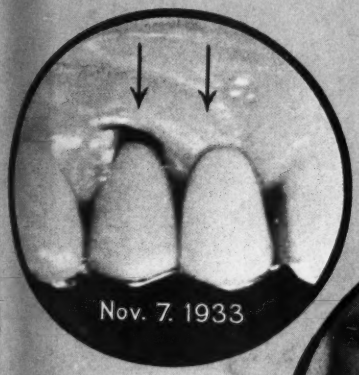
R.B.WAITE

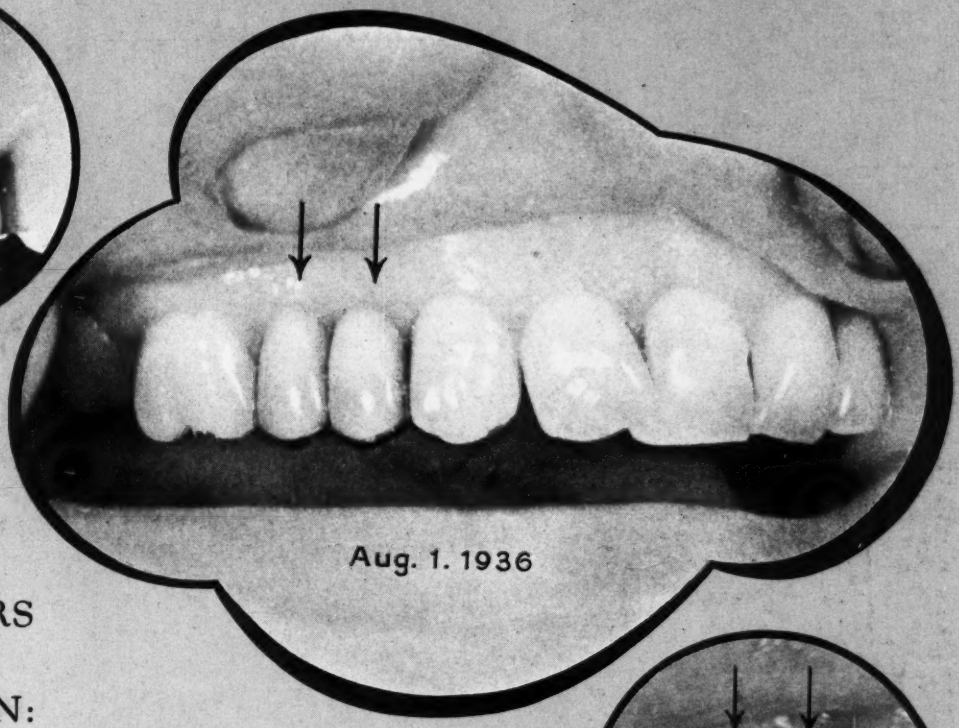
THE ANTIDOLOR MFG. COMPANY, INC.
170 Varick St., New York, N. Y.
Laboratories: Springville, N. Y.

Cobefrin, Reg. U. S. Pat. Off. & Can., Winthrop Chemical Co. Brand of Nordefrin.

BRIDGEWORK...

WITH STEELE'S TRUPONTICS



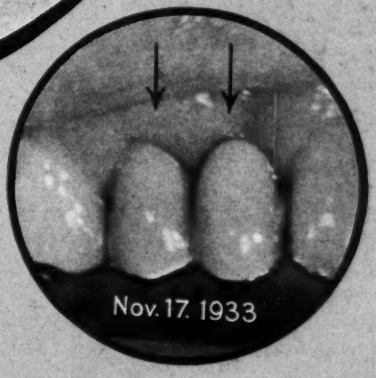


THREE YEARS
AFTER
EXTRACTION:

Here is photographic proof of Trupontic adaptability. Notice condition of the gum tissue and its adaptation to highly glazed porcelain.

In this case the first right bicuspid had been missing for several years. The bridge was placed in the mouth immediately following extraction of the abscessed second right bicuspid.

This Trupontic restoration is only one of many giving complete satisfaction in actual service.



— the modern way

NOTE

Adaptation of Trupontics to tissue is important. A new free booklet is available covering this subject. Send for it.

THE COLUMBUS DENTAL MFG. CO. Columbus, Ohio, U.S.A.

HARMONIOUS SHADES FOR MEDIUM COMPLEXION TYPES COMBINING LIGHT HAIR AND BROWN EYES ARE FOUND ONLY IN

NEW RITE

SHADES 39, 41, 42, 43, 44, 46 WITH THE UNDERLINED SHADES PREFERRED.

THE DENTISTS' SUPPLY COMPANY OF NEW YORK